



**COUNTY OF HENRICO  
DEPARTMENT OF FINANCE  
PURCHASING DIVISION  
CONTRACT EXTRACT  
NOTICE OF RENEWAL**

DATE:	March 15, 2024
CONTRACT COMMODITY/SERVICE: <i>(include contracting entity if cooperative)</i>	Cancer and Cardiovascular Screening for Division of Fire
CONTRACT NUMBER:	2430A
COMMODITY CODE:	948.74
CONTRACT PERIOD:	March 15, 2024 through March 14, 2025
RENEWAL OPTIONS:	3 one-year renewal options through 2028
USER DEPARTMENT:	Fire
Contact Name:	Anna Newell
Phone Number:	804-501-4926
Email Address:	<a href="mailto:FireController@henrico.us">FireController@henrico.us</a>
HENRICO COOPERATIVE TERMS INCLUDED:	Yes
SUPPLIER: Name:	Hampton Road Ultrasound, LLC
Address:	1015 Eden Way N. Suite A
City, State:	Chesapeake, VA 23320
Contact Name:	Ayisha Buggs
Phone Number:	757-575-5450 757-575-5460
Email address:	<a href="mailto:Ayisha.hamptonroadsultrasound@gmail.com">Ayisha.hamptonroadsultrasound@gmail.com</a>
ORACLE SUPPLIER NUMBER:	633626
BUSINESS CATEGORY:	Small, Minority, Women
PAYMENT TERMS:	Net 45
DELIVERY:	As needed and requested
FOB:	n/a
BUYER: Name:	Eileen M. Falcone, CPPB
Title:	Assistant Division Director
Phone:	804-501-5637
Email:	Fal51@henrico.us

This contract is the result of a competitive solicitation issued by the Department of Finance, Purchasing Division. A requisition must be generated for all purchases made against this contract and the requisition must reference the contract number.

**PRICE SCHEDULE – CONTRACT NO.2430A**  
\$5,600 per “scheduled exam day”



COMMONWEALTH OF VIRGINIA  
**County of Henrico**

Annual Contract for Cancer and Cardiovascular Screening for Division of Fire

Contract No. 2430A  
Amendment No. 1  
November 16, 2023

**Whereas**, the County of Henrico, Virginia (the "County") and Hampton Roads Ultrasound, LLC ("Contractor") entered into Contract No. 2430A (the "Contract") dated March 15, 2023 to provide Cancer and Cardiovascular Screening for Division of Fire when needed and requested by the County; and,

**Whereas**, the original Contract term was from March 15, 2023, to March 14, 2024; and,

**Whereas**, the parties wish to renew the Contract for an additional one-year term beginning March 15, 2024 and ending March 14, 2025; and

**Whereas**, by letter dated November 10, 2023, Contractor agreed to renew the Contract at the current contract pricing; and

**Now, therefore**, the parties agree to renew and amend the Contract as follows:

1. The Contract is hereby renewed for an additional one-year term beginning March 15, 2024 and ending March 14, 2025 at the current Contract pricing.
2. All other provisions of the Contract remain in full force and effect.

In witness whereof, the parties have caused this Amendment No. 1 to the Contract to be executed by the following duly authorized individuals:

Hampton Roads Ultrasound, LLC  
1015 Eden Way N. Suite  
Chesapeake, VA 23320

Signature

Ayisha Buggs, CEO

Printed Name and Title

11-16-23

Date

County of Henrico, Virginia  
P.O. Box 90775  
Henrico, VA 23273

John A. Vithoulkas  
County Manager

Date

APPROVED AS TO FORM

*Adam Braun* 11-27-23  
Assistant County Attorney



COMMONWEALTH OF VIRGINIA  
**County of Henrico**

**Professional Services Contract  
Contract No. 2430A**

This Professional Services Contract (this "Contract") entered into this 15 day of March 2023, by Hampton Roads Ultrasound LLC (the "Contractor") and the County of Henrico, Virginia (the "County").

**WHEREAS** the County has awarded the Contractor this Contract pursuant to Request for Proposals No. 22-2430-10EMF, as modified by Addendum 1, dated November 2, 2022 (the "Request for Proposals"), for Cancer and Cardiovascular Screening for Henrico County Division of Fire.

**WITNESSETH** that the Contractor and the County, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

**SCOPE OF CONTRACT:** The Contractor shall provide the services to the County as set forth in the Contract Documents.

**COMPENSATION:** The compensation the County will pay to the Contractor under this Contract shall be a flat rate of \$5,600 per "scheduled exam day". A "scheduled exam day" is when 14 exams are scheduled for a specific date. The number of exams shall not exceed 14. Should there be a "no-show" or if a patient cancels, the flat rate shall still be paid. The County and the Contractor will work together and try to fill the cancellation spot if time allows.

**CONTRACT TERM:** The Contract term shall be for a period of one (1) year beginning from date of execution of this contract. The County may renew the Contract for up to four (4) one-year terms giving 30 days' written notice before the end of the term unless Contractor has given the County written notice that it does not wish to renew at least 90 days before the end of the term.

**CONTRACT DOCUMENTS:** This Contract hereby incorporates by reference the documents listed below (the "Contract Documents") which shall control in the following descending order:

1. This Non-Professional Services Contract between the County and Contractor.
2. The Negotiated Modifications (Exhibit A).
3. The General Contract Terms and Conditions included in the Request for Proposals.
4. HIPAA "Business Associate Agreement" (Exhibit B).
5. Contractor's Follow Up Questions dated December 7, 2022, Best and Final Offer email dated January 30, 2023 (Exhibit C).
6. Contractor's Original Proposal dated November 7, 2022 (Exhibit D).
7. The Scope of Services included in the Request for Proposals.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound hereby.

Hampton Roads Ultrasound, LLC  
1015 Eden Way N. Suite A 23320  
Chesapeake, VA 23320

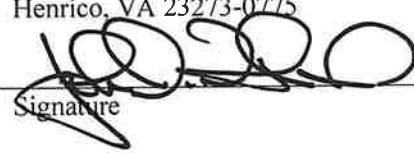
  
\_\_\_\_\_  
Signature

Ayisha Buggs, CEO  
\_\_\_\_\_  
Printed Name and Title

3-15-23  
\_\_\_\_\_  
Date

County of Henrico, Virginia  
P.O. Box 90775

Henrico, VA 23273-0775

  
\_\_\_\_\_  
Signature

John A. Vithoulkas  
\_\_\_\_\_  
County Manager

3/15/2023  
\_\_\_\_\_  
Date

Approved as to form by  
Assistant County Attorney

  
3-15-23



**EXHIBIT A**  
**NEGOTIATED MODIFICATIONS TO**  
**CONTRACT No. 2430A**

These Negotiated Modifications may be used to construe the parties' intentions in entering Contract No. 2430 (the "Contract") for Cancer and Cardiovascular Screening for Henrico County Division of Fire and clarify the parties' understanding of the underlying Request for Proposals. By signing the Contract, the parties thereto have approved these Negotiated Modifications as of the effective date of the Contract.

1. The effectiveness of ultrasound depends on the ability of sound waves to penetrate tissue. Air (gas) and body habitus (density of fatty tissue) may limit some measurements and the ability to see organs in detail. HRU will make every effort to provide the measurements required for a proper diagnosis. The lack of fasting, a full bladder, greasy food and colored drinks (i.e., coffee, soda and juices) can limit the exams effectiveness.

2. DOF cannot mandate fasting and understands personnel's choices can affect results.

3. HRU will provide participants with pre-screening instructions during their online registration. HRU will also send them an instant message prior to their screening appointment, to remind them of any preparation instructions.

4. Participants may decline any ultrasound screening. Some screenings require disrobing at the discretion of the participant. HRU will make every effort to ensure the participants are informed and comfortable before performing the examination.

5. HIPAA regulations prevent HRU from sharing patient information without consent. This limits the amount of data given to not only the primary care team but also the County. HRU will strongly encourage participants to share their screening results with their PCP.

6. Screenings can lead to false positive or negative results. A follow up may be required to confirm the absence or presence of disease. Serial follow-up is important after a diagnosis.

7. Transthoracic Echocardiogram may have limitations on its use for adult patients. For patients with chronic obstructive pulmonary disease, the interposition of air-filled lung between the body surface and the heart severely limits access, and complete examination may not be possible.

8. Abnormal findings will require biopsy or advanced imaging in order to definitively validate the status of a mass.

9. The County will provide adequate space for the performance of all screenings on the agreed upon dates.

10. Henrico County DOF will agree on designated days for screenings. The County will encourage the participants to attend their scheduled appointment, except for the presence of emergencies.

11. HRU can schedule up to 14 participants a day. Screening days will be 1-2 days a week depending on DOF preference. HRU prefers the day(s) of the week chosen to stay consistent unless prior arrangements are made for a make-up day or in case of an emergency. Preferably, participant should pre-register to receive screening preparation instructions, if applicable. Pre-registered participants will

be provided a time slot and are identified by name. HRU will not keep a waiting list. A phone number will be provided, on the registration website, that directly reaches the onsite medical assistant. Participants can call daily to check screening available slots.

12. These screenings are not mandatory, and each participant will have the opportunity to choose which examinations they would like to undergo.

13. Participants will choose the screenings they would like to undergo from a list of tests from the Cancer and Cardiovascular Screening packages. HRU understands that participants are not required to be screened for all exams listed in each package. They can choose the exams they would like to undergo, but the cost for the packages remains the same.

14. HRU will comply and use the DOF link provided to sign up for ACH services for satisfying invoices.

**EXHIBIT B**  
**HIPAA BUSINESS ASSOCIATE AGREEMENT**

**WHEREAS**, the County of Henrico (the "County") and Hampton Roads Ultrasound LLC ("Business Associate") entered into a contract on May 15, 2023 for the performance of Cancer and Cardiovascular Screening for Henrico County Division of Fire (the "Contract"); and

**WHEREAS**, the County is a hybrid entity including covered health care components and internal business associates under the federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA") and the American Recovery and Reinvestment Act of 2009 ("ARRA"), Title XIII of ARRA, the Health Information Technology for Economic and Clinical Health Act ("HITECH") Subtitle D; and

**WHEREAS**, HIPAA, HITECH, and the implementing regulations have established Privacy and Security Standards (the Privacy, Security, Breach Notification and Enforcement Rules at 45 C.F.R. §§ 160 and 164); and

**WHEREAS**, Business Associate is directly subject to HIPAA, Title XIII of ARRA, and amendments thereto, and HITECH Subtitle D, and all related rules and regulations in effect and any amendments thereto; and

**WHEREAS**, Business Associate may receive from the County and use and/or disclose records that include information that relates to the past, present, or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present, or future payment for the provision of health care to an individual; and that identifies the individual; or with respect to which there is a reasonable basis to believe the information can be used to identify the individual (Protected Health Information, "PHI"); and

**WHEREAS**, the Privacy and Security Standards require a Business Associate Agreement to ensure that PHI is adequately safeguarded as part of the Contract provisions.

**NOW, THEREFORE**, in consideration of the mutual covenants and agreements contained in this Business Associate Agreement ("BAA") and in the Contract and for other good and valuable consideration, the receipt and sufficiency of which is acknowledged by the parties, the County and Business Associate agree as follows:

**I. DEFINITIONS**

The following terms used in this BAA have the same meaning as those terms in the Privacy and Security Standards: Breach, Business Associate, Disclosure, Individual, Minimum Necessary, Notice of Privacy Practices, Protected Health Information, Required by Law, Subcontractor, and Use.

**II. OBLIGATIONS OF THE BUSINESS ASSOCIATE**

1. Permitted Uses and Disclosure of PHI. Business Associate's activities for and/or on behalf of the County may involve the use and/or disclosure of PHI. Business Associate will use and/or disclose PHI only to the extent necessary to perform its

duties and obligations to the County or as otherwise required by law. Business Associate may permit the use of PHI by third parties, including its employees, contractors, agents, or other representatives, only to the extent directly related to and necessary for the performance of its duties and obligations to the County as required by the Contract or as otherwise permitted by law. Business Associate and its agents or subcontractors will only request, use and disclose the minimum PHI necessary to perform its duties and obligations in accordance with HIPAA, the HIPAA Regulations, and HITECH.

2. Safeguards Against Misuse of Information.

- a. Business Associate will use appropriate and reasonable safeguards to maintain the security of and prevent the improper use or disclosure of PHI.
- b. Business Associate will comply with 45 C.F.R. §§ 160.302 *et seq.* in utilizing administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic PHI, as that term is defined in 45 C.F.R. § 160.103, that it creates, receives, maintains or transmits on behalf of the County.
- c. Business Associate will train employees in information security, designating a security officer, conducting an information risk analysis, and developing a risk management remediation plan.
- d. Business Associate will abide by the prohibitions under the ARRA regarding the sale and marketing of PHI.
- e. Business Associate will comply with any other conditions that the Secretary of the Department Health and Human Services requires with respect to electronic PHI.

3. Reporting Breaches and Other Security Incidents and Mitigation of Effect.

- a. Business Associate will promptly report to the County: (1) any use or disclosure of PHI not authorized by the Contract of which it becomes aware; and (2) any "security incident," as defined by 45 C.F.R. § 164.304, of which it becomes aware. Business Associate will take reasonable steps to cure any such security incident and implement procedures for mitigating the harmful effects from any such security compromise. Business Associate will report the measures it took to mitigate any security compromise that may have occurred and shall report any data loss or other information system compromise as a result of the incident.
- b. In the event of a breach of unsecured PHI as defined in 45 C.F.R. § 164.410, Business Associate will comply with the breach notification requirements of 45 C.F.R. § 164.410 and notify the County without reasonable delay, and no later than two (2) business days of when Business Associate becomes aware of a breach. Notification of security incidents will include the identity of each individual whose unsecured PHI has been or is reasonably believed to have been accessed, acquired, or disclosed inappropriately during such breach.

Notifications will contain any other such information as Business Associate reasonably believes is required for the County to further investigate. Business Associate will also provide such assistance and further information as reasonably requested by the County in meeting its responsibility to notify all individuals affected, as detailed in 45 C.F.R. § 164.404.

4. Use and Disclosure of PHI by Subcontractors and Agents.

- a. Business Associate will require any subcontractor or agent that is authorized to review, use or disclose PHI obtained by Business Associate from the County, to agree in writing to adhere to the same restrictions, conditions, and requirements regarding the use and disclosure of PHI and safeguarding of PHI that apply to Business Associate.
- b. Business Associate will ensure that any subcontractor or agent to whom it provides electronic PHI that was created, received, maintained or transmitted on behalf of the County agrees in writing to implement reasonable and appropriate safeguards to protect the confidentiality, security, and integrity of the electronic PHI.

5. Access to Information. Throughout the term of this BAA, Business Associate will make available to the County all PHI provided to Business Associate by the County for so long as such information is maintained. Upon written request from the County, Business Associate will make an individual's PHI available to the County within fifteen (15) days of an individual's request for such information as notified by the County. In the event that the requesting individual's PHI is neither maintained nor accessible on site by the County or the Business Associate, the extended timeframe set forth in 45 C.F.R. § 164.504(3)(2)(iii)(C) will be available for Business Associate to respond to the County's request. In the event any individual requests access to County-provided PHI directly from Business Associate, Business Associate shall forward such request to the County. Any denials of access to PHI requested shall be the responsibility of the County. Business Associate shall further conform with and meet all the requirements of 45 C.F.R. § 164.524.

6. Availability of PHI for Amendment. Upon receipt of a request from the County to update PHI for an individual, Business Associate will incorporate any such amendment into its records within thirty (30) days of the request or as may be required by 45 C.F.R. § 164.526. If Business Associate receives a request from an individual for an amendment to County-provided PHI, Business Associate shall forward such request directly to the County. Any review and consideration of a requested amendment shall be the responsibility of the County.

7. Accounting of Disclosures. Upon request from the County, Business Associate will make available to the County such information as is in Business Associate's possession and is required for the County to make an accounting as required by 45 C.F.R. § 164.528. In the event the request for an accounting is delivered directly to Business Associate, Business Associate will forward such request to the County as soon as practicable. It shall be the County's responsibility to prepare and deliver any

such accounting requested. Business Associate will maintain an appropriate record keeping process to enable it to comply with the requirements of this Section.

8. Use and Disclosures for Business Associate's Purposes.

- a. Business Associate will only use or disclose PHI to the minimum necessary to carry out its duties and obligations under the Contract or as required by law. Business Associate may not use or disclose PHI in a manner that would violate 45 C.F.R. § 164.500 *et seq.*
- b. Business Associate may disclose PHI for its own proper management and administration or to carry out its legal responsibilities, provided the disclosures are required by law, or Business Associate obtains reasonable assurances from the person to whom the PHI is disclosed that it will remain confidential and be used or further disclosed only as required by law or for the purposes for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the PHI has been breached.

9. Availability of Books and Records. Business Associate will make its internal practices, books, and records relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of the County available to the County and the Secretary of the Department of Health and Human Services for purposes of monitoring compliance with the Privacy and Security Standards.

10. Indemnification. Business Associate will indemnify and defend the County, its agents, representatives, and employees from any claims, demands, losses, or liabilities including attorney's fees arising out of or related to Business Associate's breach or alleged breach of the terms of this BAA by Business Associate or any agent or subcontractor of Business Associate.

11. Compliance with Requirements. To the extent the Business Associate is to carry out one or more of the obligations of the County under 45 C.F.R. § 164.500 *et seq.*, Business Associate will comply with the requirements that apply to the County in the performance of such obligations.

### III. OBLIGATIONS OF THE COUNTY

1. Notice of Privacy Practices. The County will notify Business Associate of any limitation in its Notice of Privacy Practices, which the County, or any of its departments, provides or makes available to individuals pursuant to 45 C.F.R. § 164.520, to the extent that such limitation may affect Business Associate's use or disclosure of PHI.

2. Restrictions on Disclosures. If applicable to Business Associate, the County will notify Business Associate as soon as practicable of any request for restrictions by an individual of the use or disclosure of the individual's PHI that the County has agreed to accept. The County will also notify Business Associate, if applicable, of any

changes in, withdrawal, or revocation of any authorization or other permissions(s) granted the County by an individual for the use and disclosure of the individual's PHI.

3. Impermissible Requests. The County will not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy or Security Standards if done by the County. Nothing in this section shall preclude Business Associate from using or disclosing PHI for its management and administrative activities as provided in Section II.8 above.

#### **IV. MISCELLANEOUS**

1. Term. This BAA will remain in effect for the term of the Contract between the County and the Business Associate, including any extensions or renewals thereof.
2. Termination for Cause. Upon the County's knowledge of a material breach by Business Associate, the County will provide Business Associate an opportunity to cure the breach or end the violation. The County may terminate the Contract: (a) immediately if Business Associate has breached a material term and cure is not possible; or (b) upon Business Associate's failure to cure the breach or end the violation within the time specified by the County.
3. Effect of Termination.
  - a. Except as provided in paragraph b of this section, upon termination of this BAA for any reason, Business Associate will return or destroy all PHI received from the County, or created or received by Business Associate on behalf of the County. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate will not retain copies, including electronic copies, of the PHI.
  - b. In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate will provide the County notification of the conditions that make return or destruction infeasible and extend the protections of this BAA to such PHI and limit further uses and disclosures of such PHI to those purposes that make the return or destruction infeasible, for so long as Business Associate maintains such PHI.
4. Amendments. This BAA, and any provision thereof, may be amended, modified or deleted by written agreement of the parties. The parties may amend this BAA from time to time as necessary for the County and Business Associate to comply with the Privacy or Security Standards and all other applicable laws or regulations.
5. Survival. The respective rights and obligations of Business Associate and the County survive termination of this BAA and any underlying Contract.
6. Interpretation. This BAA shall be interpreted as broadly as necessary to implement and comply with the Privacy and Security Standards. Any ambiguities in this BAA will

be resolved in favor of a meaning that complies with the Privacy and Security Standards.

7. Governing Law and Venue.

- a. This BAA is governed by applicable federal laws and the laws of the Commonwealth of Virginia without regard to laws relating to choice of law or conflicts of law.
- b. The parties intend to comply with all applicable laws. To the extent that this BAA is or becomes inconsistent with any applicable law, this BAA shall be read to conform with the applicable law.
- c. Exclusive venue for any dispute arising hereunder will be resolved in the Circuit Court of the County of Henrico, Virginia.

8. Coordination of Documents. In the event of a conflict between a provision of this BAA and the Contract, the provisions of this BAA will control.

9. Notices. All notices, requests, demands and other communications required or permitted to be given or made under this BAA shall be in writing, shall be effective upon receipt, and shall be sent by (a) personal delivery; (b) certified or registered United States mail, return receipt requested; (c) overnight delivery services with proof of delivery; or (d) facsimile with return facsimile acknowledging receipt. Notices will be sent to the address below:

To Covered Entity:            Brandon Hinton, Privacy Officer  
County of Henrico  
4301 E. Parham Road  
P.O. Box 90775  
Henrico, Virginia 23273-0775  
Facsimile: (804) 501-4162

To Business Associate:      Hampton Roads Ultrasound, LLC  
1015 Eden Way N., Suite A  
Chesapeake VA 23320  
Facsimile: 757-447-3988



**IN WITNESS WHEREOF**, the parties hereto have signed this Business Associate Agreement.

Hampton Roads Ultrasound LLC

By:   
Ayisha Buggs

Title: Chief Executive Officer

Date: 3-15-23

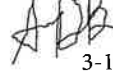
County of Henrico, Virginia

By:   
John A. Vithoukias

Title: County Manager

Date: 3/15/2023

Approved as to form by  
Assistant County Attorney

  
3-15-23

Please have the Manager sign and date and  
return to Donna

**EXHIBIT C**  
**RFP 22-2430-10EMF**  
**Cancer and Cardiovascular Screening for**  
**Henrico Division of Fire**  
**Follow Up Questions after Presentations**  
**December 7, 2022**

**Firm: Hampton Roads Ultrasound**

1. Can additional information from the registration process be captured and used when reporting the aggregate review?
  - a. Yes, additional information requested by the Department of Fire can be collected and added to the registration form. Evidence such as medical history, lifestyle, and years of service can be helpful when reporting aggregated data.
2. Provide samples or screen shots of the aggregate reports.
  - a. Please see attached documents. The analysis tool we utilize allows us to aggregate data based on several requested values. We can draw inferences and connections between abnormal tests results and risk factors and several other requested information. Attached is an example of all tests, the degree of abnormality and how many abnormal versus normal exams and particular aggregations. For example, of the participants screened, 50% were normal with no congestive heart failure, 50% were abnormal with congestive heart failure. Of these 50% with heart failure there 3 that also had an ovarian mass, and 3 without an ovarian mass, drop down boxes allow us to evaluate aggregated data across all tests.
3. How are the aggregate reports made available to the Division of Fire (DOF)?
  - a. Aggregate reports will be emailed to the contract liaison. These reports will be stored and retained using OSHA record keeping requirements.
4. What tests are offered la carte and what are not?
  - a. The ideal screening package would include both cardiovascular and cancer screenings, however they can be ordered separately. Participants can choose either of the two packages or both packages. The Cardiovascular Screening package includes echocardiogram, carotid and abdominal aorta ultrasound exams. The Cancer screening package includes thyroid, liver, gallbladder, spleen, kidneys, ovaries, uterus, and scrotum ultrasounds. Both packages are charged as a whole, and no exams are charged individually.
  - b. Hematologic (blood) labs are available a la carte. They include the following:
    - i. CBC- Can indicate lymphatic cancers
    - ii. CA 125 – Tests for ovarian cancer
    - iii. CEA – Tests for colorectal cancer
    - iv. CA 19.9 Tests for gastric/pancreatic or stomach cancer
    - v. PSA – Can detect possible prostate cancer
    - vi. AFP – Helps detect testicular cancer, stomach, liver, pancreatic renal, brain, lymphatic cancers

- vii. Urinalysis – Tests for blood in the urine which can indicate infection or bladder, urologic or kidney cancers
- viii. High-sensitivity CRP (hs-CRP) tests help determine the risk of heart disease before symptoms are present. Higher hs-CRP levels are associated with a higher risk of heart attack, stroke, and cardiovascular disease.
- ix. Lipid panel – detects high cholesterol

5. Provide information on what procedures and criterion are used to evaluate and diagnose results?

- a. Each test has different interpretation criteria (See attach document for a description). The presence of an abnormal mass is described by our reading physicians. The attached documents how technologists perform the examinations and document abnormal findings. They also provide visual representations of abnormal findings.

6. What level of clinician evaluates and diagnoses results?

- a. Hampton Roads Ultrasound requires that all exams be evaluated by a board-certified Radiologists and Cardiologists, licensed in the state of Virginia.

Dennis Walker, DO, certified by the American Board of Radiology, is responsible for reading exams that include thyroid, liver, gallbladder, spleen, kidneys, ovaries, uterus, scrotum, carotid and abdominal aorta ultrasound exams.

Joseph Freedman, MD, Keith Newby, MD and Mark East, MD are practicing Cardiologists who are certified by the American Board of Cardiovascular Medicine. They are responsible for reading tests for diagnosing heart conditions. This includes echocardiogram ultrasound, blood pressure tests, MRI and stress tests.

7. Describe how results are communicated to the employee and what level of certification/licensing the person communicating the results has.

Results are communicated to participants by our Physician Assistant (PA) and Nurse Practitioner (NP). Our PA has dual certifications, Mr. Smalls is licensed by Physician Assistant- Virginia Board of Medicine and American Registry of Diagnostic Medical Sonography in diagnostic imaging. He is an internal medicine provider and a registered Vascular Sonographer. Our Nurse Practitioner is licensed by the Virginia Board of Nursing and has several years of experience in family medicine.

Participants with abnormal results will be contacted, within one week by our PA or NP. During a screening, if immediate life-threatening images are seen, sonographers will follow the emergency protocol required. For example, if a cardiac thrombus is detected during a screening, the sonographers are required to contact the Nurse Practitioner or Physician Assistant for immediate medical advice. At this time, the NP or PA will contact the participant's doctor for recommendations, and in most situations the participant will be advised to seek immediate medical attention from the nearest hospital. In addition, the Nurse Practitioner or Physician Assistant will contact the Reading doctors to prioritize the screening results. These results will be available within 24 hours or sooner.

Participants' results can only be discussed with a licensed medical provider. For non-emergent abnormal result, the Nurse Practitioner or Physician Assistant will contact the participant within a week. During these discussions, the doctors' interpretations and exact findings are communicated. Participants will be strongly advised to share their results with their primary care provider (PCP). In the medical hierarchy, patients are encouraged to seek primary care as the first step for coordinating their healthcare. Once their PCP is established any further healthcare specialist needed will then be recommended.

If a participant does not have a primary care team and need a local referral, HRU will provide a list of available primary care doctors from HCA Virginia Health System network. The referred doctors are independent providers with privileges to the Henrico Doctors' Hospital. HCA Virginia Health System network provides a comprehensive group of general and specialists doctors for continued care.

Participants with normal results, will receive their final report online in our secure Picture Archiving and Communication System (PACS) within a week. Once reports are available, participants can access their results, using a login pin provided by email. Secure access will be available for one year after screening. Normal results can be discussed over the phone, at the participant's request. A phone call to Hampton Roads Ultrasound office personnel, to request a call from a provider, is required. Only a licensed healthcare provider can discuss results. Final reports will also be available for printing two weeks after screening. At the request of the participant, screening results are faxed to their physician.

8. What (if any) initial care plans or consultations are involved at the time results are communicated to the employee?
  - a. HRU does not assume the role of primary care provider (PCP). We allow the participants PCP to advise them of their healthcare options. We believe that a screening is a small picture of the participant's health history. A thorough review of the patient's medical history is needed before healthcare options are suggested. During consultations, the Nurse Practitioner or Physician Assistant, will refer the participant to their primary care physician (PCP) or provide a referral for one. In the medical hierarchy, patients are encouraged to seek primary care as the first step for coordinating their healthcare. Once a PCP is established, any further healthcare specialist needed will then be recommended. HRU has partnered with Virginia Health Systems for 16 years. We are a trusted source for providing ultrasound services for their patients. Our physician partners at HCA Virginia Health Systems network, has assured us that they have a network of doctors available for referrals. This Health Systems network provides cost effective solutions for primary and specialty care referrals.
9. What (if any) follow up is provided after results are communicated to the employee?
  - a. by whom are they provided; and
    - a. HRU will provide phone call follow-ups to the participants with abnormal results. After the initial consultation, participants are referred to their primary care physician for specialist referral. The follow-up phone calls are performed by our Virginia licensed

Nurse Practitioner for the purpose of tracking their continued care. The inquiry will validate if participants have established a relationship with a PCP and if the abnormalities found on ultrasound have had further workup. For example, masses found should have a confirmatory CT, MRI or biopsy performed. These results will be correlated with ultrasound findings. This information will be later aggregated for reporting to the Department of Fire.

b. at what time interval(s) after results are these communicated?

a. The first follow-up phone call will occur 30 days after the initial reporting of abnormal results. This phone call will document PCP follow-up and referrals to specialists. A second follow-up call will occur at 6 months. This phone call will provide evidence of further testing, surgical procedures, and biopsy results. These results will be reported to the Department of Fire in our aggregated report.

10. If further work up is indicated, ideally a specialist will want to review the actual scan, not only printed report. Would ultrasound films/disc be made available upon request of records release? Discuss the process for this.

a. Yes. HRU will create a disc with the images for specialists to review the actual scan. Once the release of records is received, we will provide the requesting entity with a CD copy of the images and report. CDs will be mailed to the requestor within 7 days of request. If the images are needed sooner, the images and report will be provided by secure email link.

11. In the case of Worker's Comp claims, are your personnel prepared to go to court or testify on behalf of their findings at no additional cost?

a. Yes, HRU personnel are prepared to go to court to testify in reference to findings of the ultrasounds performed. There will be no additional fees for this service.

12. What information will be provided on the invoices?

a. Invoices will consist of the last name of the participant screened, the packaged test performed (i.e the complete screening, the cardiovascular screening or the cancer screening), date and cost for the screening and the total invoice for the month.

13. What are your requirements for the space needed to provide the services requested in the RFP?

a. We require a space that allows for two scanning stations approximately 15 feet x 20 feet.

14. What items will be provided by your firm when providing the services requested of the RFP? (i.e. tables, screens, etc.)

HRU will provide the necessary materials to successfully complete all duties. These materials include portable stretchers, ultrasound machines, software, drape cloths, robes, disinfectant cleansers, privacy screens, IPads, and specialized disposable containers. Privacy partitions, table paper for covering the stretcher after each patient, all disinfecting supplies needed, gloves, probe covers, and other required personal protective equipment.

15. If DOF decides to offer these services to retirees, discuss how billing will be handled since DOF will not be paying for them?

a. Retirees will be provided a cost-effective price for ultrasound packages. Payment is due at the time of pre-registration. Participants are encouraged to registered at least 72 hours before screenings.

## Falcone, Eileen

---

**From:** Ayisha Buggs <ayisha.hamptonroadsultrasound@gmail.com>  
**Sent:** Monday, January 30, 2023 9:38 AM  
**To:** Falcone, Eileen  
**Subject:** Re: RFP 22-2340-10EMF Cancer and Cardiovascular  
**Attachments:** image001.png

Yes or as agreed to previously, 14 exams paid for on scheduled exam days.

On Mon, Jan 30, 2023, 9:33 AM Falcone, Eileen <[fal51@henrico.us](mailto:fal51@henrico.us)> wrote:

Ayisha

I will send this to the committee and then send a summary of things we discussed before we move forward. I just want to confirm that a “scheduled exam day” would require that we have 14 exams scheduled.

*Eileen M. Falcone, CPPB*

*Assistant Purchasing Division Director*

*804-501-5637*

*County of Henrico*

*Division of Purchasing*

*PO Box 90775*

*8600 Staples Mill Road*

*Henrico, VA 23273-0775*



---

**From:** Ayisha Buggs <[ayisha.hamptonroadsultrasound@gmail.com](mailto:ayisha.hamptonroadsultrasound@gmail.com)>  
**Sent:** Friday, January 27, 2023 6:38 PM  
**To:** Falcone, Eileen <[fal51@henrico.us](mailto:fal51@henrico.us)>  
**Subject:** Re: RFP 22-2340-10EMF Cancer and Cardiovascular

Thank you Eileen for your response. I have discussed your proposal with our committee and we have agreed to the county's terms. We will provide ultrasound services at a daily rate of \$5,600 per scheduled exam day for up to 14 exams only. We understand we will be paid \$5,600 regardless of the number of exams done but not to exceed 14 exams per day. This rate would only be paid for scheduled exam days. Thank you for this opportunity and we look forward to working with the Henrico County Department of Fire.

Ayisha Buggs

CEO

Hampton Roads Ultrasound

757-575-5460

On Fri, Jan 27, 2023 at 4:10 PM Falcone, Eileen <[fal51@henrico.us](mailto:fal51@henrico.us)> wrote:

Good afternoon

After having discussions with the committee, we would like to know if the following would be a solution regarding the pricing and scheduling.

Regarding the price per exam, the County understands there is a risk involved because we cannot guarantee how many participate there will be in this program.

1. Would your firm consider a daily rate of \$5,600 per scheduled exam day for up to 14 exams only. Your firm would still be paid the \$5,600 no matter how many exams were actually done but not to exceed 14 exams for that day. This rate would only be paid for scheduled exam days.

Please respond to the by Tuesday, January 31<sup>st</sup>.

Thank you

*Eileen M. Falcone, CPPB*

*Assistant Purchasing Division Director*

*804-501-5637*

*County of Henrico*



# H.R.U

**HAMPTON ROADS ULTRASOUND**



## **Response to RFP 22-2430-10EMF Cancer and Cardiovascular Screening (BPM000565)**



DEPARTMENT OF FINANCE  
Oscar Knott, CPP, CPPO, VCO  
Purchasing Director

COMMONWEALTH OF VIRGINIA

## County of Henrico

### Addendum No. 1

**Date:** November 2, 2022  
**Request for Proposal:** #22-2340-10EMF Cancer and Cardiovascular Screening for Henrico  
Division of Fire  
**Receipt Date/Time:** November 10, 2022; 2:00 p.m.  
**Subject:**

Ladies/Gentlemen,  
Please make the following corrections, deletions and/or additions to the above referenced RFP:

**The RFP due date has been changed to November 15, 2022, at 2:00 p.m.**

**Electronic responses on eVA was enabled on November 1, 2022.**

Sec.IIA.4 – Change to read:

4. The Successful Offeror shall forward copies of any abnormal results along with patient instructions regarding primary care follow-up (as appropriate) to individuals who were instructed to seek medical follow-up to address any medical conditions, or lab abnormalities, identified during the medical evaluation. The Successful Offeror will provide a medical practitioner (Medical Doctor; **Physician Assistants, or** Nurse Practitioner) for positive test result consultation and recommend referrals as necessary.

Sec. VIII.A – Replace the Evaluation Criteria table with the following table.

Evaluation Criteria	Weight
<b>Compliance with Functional Requirements</b> (In accordance with Section VII, Item B(3), B(5), B(6) and B(7) , this criterion considers <b>the extent to which the Offeror's proposal complies with the functional requirement of the services solicited by this RFP as specified in Section II.</b> )	25
<b>Service Approach and Methodology</b> (In accordance with Section VII Item B(5), B(6), and B(7), this criterion considers the Offeror's proposed service approach and methodology to fulfilling the services requested by this RFP as specified in Section II.)	40
<b>Offeror Qualifications, Experience, Resumes and References</b> (In accordance with Section VII, Item B(4), this criterion considers the Offeror's and its assigned staff's experience and qualifications for providing services of similar size and nature as those requested by this RFP as specified in Section II.)	30
<b>Quality of Proposal Submission / Oral Presentations</b> (This criterion considers the overall quality of the Offeror's proposal submitted and any oral presentations required.)	5
Total	100


All other specifications and General Terms and Conditions shall remain the same.

Offerors must take due notice and be governed accordingly. Acknowledgement of the receipt of this addendum shall be made in your proposal. Failure to acknowledge this addendum may result in your proposal being declared non-responsive.

Sincerely,

Eileen M. Falcone, CPPB  
Assistant Division Director  
Fal51@henrico.us

**ACKNOWLEDGEMENT:**

Signature: 

Print Name: Ayisha Buggs

Company: Hampton Roads Ultrasound, LLC


Date: 11/7/22

## ATTACHMENT A PROPOSAL SIGNATURE SHEET

My signature certifies that the proposal as submitted complies with all requirements specified in this Request for Proposal ("RFP") No. **22-2430-10EMF Cancer and Cardiovascular Screening for Henrico County Division of Fire**.

My signature also certifies that by submitting a proposal in response to this RFP, the Offeror represents that in the preparation and submission of this proposal, the Offeror did not, either directly or indirectly, enter into any combination or arrangement with any person or business entity, or enter into any agreement, participate in any collusion, or otherwise take any action in the restraining of free, competitive bidding in violation of the Sherman Act (15 U.S.C. Section 1) or Sections 59.1-9.1 through 59.1-9.17 or Sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.

I hereby certify that I am authorized to sign as a legal representative for the business entity submitting this proposal.

LEGAL NAME OF OFFEROR (DO <u>NOT</u> USE TRADE NAME):	
Hampton Roads Ultrasound, LLC	
ADDRESS:	
1015 Eden Way N. Suite A 23320	
FEDERAL ID NO:	461434923
SIGNATURE:	
NAME OF PERSON SIGNING (PRINT):	Ayisha Buggs
TITLE:	Chief Executive Office/President
TELEPHONE:	757-575-5460
FAX:	757-447-3988
EMAIL ADDRESS:	info.hru1@gmail.com
DATE:	11/7/22

## ATTACHMENT B BUSINESS CATEGORY CLASSIFICATION FORM

Company Legal Name: Hampton Roads Ultrasound, LLC

This form completed by: Signature:  Title: CEO

Date: 11/7/22

PLEASE SPECIFY YOUR **BUSINESS CATEGORY** BY CHECKING THE APPROPRIATE BOX(ES) BELOW.

(Check all that apply.)

- ☒ SMALL BUSINESS
- ☒ WOMEN-OWNED BUSINESS
- ☒ MINORITY-OWNED BUSINESS
- ☐ SERVICE-DISABLED VETERAN
- ☐ EMPLOYMENT SERVICES ORGANIZATION
- ☐ NON-SWaM (Not Small, Women-owned or Minority-owned)

**SUPPLIER REGISTRATION** – The County of Henrico encourages all suppliers interested in doing business with the County to register with eVA, the Commonwealth of Virginia's electronic procurement portal, <http://eva.virginia.gov>.

eVA Registered? ☒ Yes ☐ No

If certified by the Virginia Minority Business Enterprises (DMBE), provide DMBE certification number and expiration date.

\_\_\_\_\_ NUMBER \_\_\_\_\_ DATE

### DEFINITIONS

For the purpose of determining the appropriate business category, the following definitions apply:

**"Small business"** means a business, independently owned and controlled by one or more individuals who are U.S. citizens or legal resident aliens, and together with affiliates, has 250 or fewer employees, or annual gross receipts of \$10 million or less averaged over the previous three years. One or more of the individual owners shall control both the management and daily business operations of the small business.

**"Women-owned business"** means a business that is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest is owned by one or more women who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more women.

**"Minority-owned business"** means a business that is at least 51 percent owned by one or more minority individuals who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more minority individuals.

**"Minority individual"** means an individual who is a citizen of the United States or a legal resident alien and who satisfies one or more of the following definitions:

1. "African American" means a person having origins in any of the original peoples of Africa and who is regarded as such by the community of which this person claims to be a part.

2. "Asian American" means a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands, including but not limited to Japan, China, Vietnam, Samoa, Laos, Cambodia, Taiwan, Northern Mariana Islands, the Philippines, a U.S. territory of the Pacific, India, Pakistan, Bangladesh, or Sri Lanka and who is regarded as such by the community of which this person claims to be a part.

3. "Hispanic American" means a person having origins in any of the Spanish-speaking peoples of Mexico, South or Central America, or the Caribbean Islands or other Spanish or Portuguese cultures and who is regarded as such by the community of which this person claims to be a part.

4. "Native American" means a person having origins in any of the original peoples of North America and who is regarded as such by the community of which this person claims to be a part or who is recognized by a tribal organization.

**"Service disabled veteran business"** means a business that is at least 51 percent owned by one or more service disabled veterans or, in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more individuals who are service disabled veterans and both the management and daily business operations are controlled by one or more individuals who are service disabled veterans.

**"Service disabled veteran"** means a veteran who (i) served on active duty in the United States military ground, naval, or air service, (ii) was discharged or released under conditions other than dishonorable, and (iii) has a service-connected disability rating fixed by the United States Department of Veterans Affairs.

**"Employment services organization"** means an organization that provides community-based employment services to individuals with disabilities that is an approved Commission on Accreditation of Rehabilitation Facilities (CARF) accredited vendor of the Department of Aging and Rehabilitative Services.

**ATTACHMENT C**  
**Virginia State Corporation Commission (SCC)**  
**Registration Information**

**The Offeror:**

☒ is a corporation or other business entity with the following SCC identification number:  
                    S4298313                      **-OR-**

☐ is not a corporation, limited liability company, limited partnership, registered limited liability partnership, or business trust **-OR-**

☐ is an out-of-state business entity that does not regularly and continuously maintain as part of its ordinary and customary business any employees, agents, offices, facilities, or inventories in Virginia (not counting any employees or agents in Virginia who merely solicit orders that require acceptance outside Virginia before they become contracts, and not counting any incidental presence of the Bidder in Virginia that is needed in order to assemble, maintain, and repair goods in accordance with the contracts by which such goods were sold and shipped into Virginia from Bidder's out-of-state location) **-OR-**

☐ is an out-of-state business entity that is including with this bid/proposal an opinion of legal counsel which accurately and completely discloses the undersigned Bidder's current contracts with Virginia and describes why those contracts do not constitute the transaction of business in Virginia within the meaning of §13.1-757 or other similar provisions in Titles 13.1 or 50 of the Code of Virginia.

Please check the following box if you have not checked any of the foregoing options but currently have pending before the SCC an application for authority to transact business in the Commonwealth of Virginia and wish to be considered for a waiver to allow you to submit the SCC identification number after the due date for bids: ☐

**ATTACHMENT D**  
**PROPRIETARY/CONFIDENTIAL INFORMATION IDENTIFICATION**

NAME OF OFFEROR: Hampton Roads Ultrasound

Trade secrets or proprietary information submitted by an Offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the Offeror must invoke the protections of Va. Code § 2.2-4342(F) in writing, either before or at the time the data or other materials are submitted. The Offeror must specifically identify the data or materials to be protected including the section(s) of the proposal in which it is contained and the pages numbers, and state the reasons why protection is necessary. A summary of trade secrets and proprietary information submitted shall be submitted on this form. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. Va. Code § 2.2-4342(F) prohibits an Offeror from classifying an entire proposal, any portion of a proposal that does not contain trade secrets or proprietary information, line item prices, or total proposal prices as proprietary or trade secrets. If, after being given reasonable time, the Offeror refuses to withdraw such classification(s), the proposal will be rejected.

SECTION/TITLE	PAGE NUMBER(S)	REASON(S) FOR WITHHOLDING FROM DISCLOSURE
N/A		

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## **Tab 1 Introduction and Signed Forms**

### **Purpose**

This proposal was prepared to provide professional ultrasound services to Henrico County Division of Fire. Hampton Roads Ultrasound (HRU) is ready and available to supply ultrasound exams in general, vascular, and cardiac screenings. We provide a variety of ultrasound exams, which includes, Carotid, Abdominal Aortic Aneurysm AAA, Echocardiogram, Thyroid, Abdominal, Bladder, Testicular, and Pelvic.

Hampton Roads Ultrasound employs Registered Vascular Technologist (RVT) credentialed by American Registry Diagnostic Medical Sonography (ARDMS) and Registered Vascular Specialist (RVS) credentialed by Cardiovascular Credentialing International (CCI). Our Radiologist and Cardiologists are Virginia practicing physicians who are governed under the guidelines, policies, and procedures of American Board of Radiology (ABR) and American Board of Cardiovascular Medical (ABCM)

HRU will support the Henrico County Division of Fire's efforts to provide diagnostic ultrasound screenings that assist in detecting and ruling out cancer and cardiovascular diseases in firefighters. We will perform these duties with high ethical standards, excellent customer service and cost-effective solutions.

Associated Benefits for onsite diagnostic ultrasound services for the County of Henrico Division of Fire:

- Quick and practical
- HRU's cost effective pricing saves up to 30% on ultrasound screening expenses.
- Eliminate the hassles associated with travel time.
- Convenient throughout the regular workday with less time away from tasks.
- Provide better flexibility for scheduling and maximize work productivity.
- Improve participation
- Empowers participants to detect life-threatening health conditions or diseases early

# Hampton Roads Ultrasound



**Together  
Performing at a  
Higher Standard!**

**1015 Eden Way N., Suite A • Chesapeake VA, 23320 • 757-575-5460 • Fax (757)-447-3988**

---

Hampton Roads Ultrasound (HRU) is pleased to present our proposal to provide ultrasound services. We are a small business that provides Vascular, Cardiac and General ultrasound services.

HRU was established to respond to the growing need for community focused services. Our objective is to provide excellent customer service with high ethical standards while focusing on the diagnostic needs of doctors' offices, healthcare facilities, education institutes, and small businesses.

As a leader in the ultrasound community, we are very proud of our track record of success. Our business venture began in 2001 as *Unique Imaging Solutions, Inc.*, a staffing, and consulting company. In 2012, under the name of Hampton Roads Ultrasound, we branched out to establish an independent ultrasound facility that offers high quality diagnostic ultrasound testing. Since then, HRU has accomplished the foundational goal of establishing a well-managed testing facility, which provides cardiac, vascular, and general and OB/GYN ultrasound services.

Hampton Roads Ultrasound is uniquely qualified to support the growing needs of the Henrico County Division of Fire. We are owned and operated by a very strategic Chief Executive Officer (CEO). Ayisha Buggs, our CEO has several years of experience in public affairs and policies. She is a key component in establishing and maintaining our corporate partners. We also have an exceptional Chief Operating Officer (COO). Alphonzo Smalls is an Internal Medicine Physician Assistant and Register Vascular Technologist. He is well educated in the disciplines of medicine and medical technology. We understand the complex concepts of dealing with corporate partners, patient care and ultrasound exams.

All our sonographers are trained to understand the importance of proper bedside manner. They will explain the ultrasound process to patients before and throughout the course of the exam. Sonographers will also answer procedural questions to help ease anxiety.

Hampton Roads Ultrasound comprehensive knowledge of effective business practices and diagnostic ultrasound cannot be matched. As a leader in the ultrasound community, HRU's initiative is to provide diagnostic testing for individuals and facilities at an affordable price. We strive to remove barriers that limit healthcare options and provide the public with choices for their diagnostic ultrasound needs. At HRU we believe that everyone deserves the right to quality healthcare. We are working to become the fundamental paradigm for future healthcare programs.

The foundation of our reputation is personable service, qualified doctors, and licensed sonographers. HRU's experience and professional background makes us uniquely qualified to fulfill your facility's needs. We aim for exceptional results in a specialized health profession. Our job is to know ultrasound and we are very confident we can accommodate your ultrasound needs.

X 

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Ayisha Buggs  
Chief Executive Officer

## **Background**

**Herein describes HRU's principles:**

### **Commitment to Leadership**

The strength of HRU lies in our leadership team. Since 2004, our executive team has established and implemented accreditation certifications for several hospitals and doctors' offices. For example, we have obtained the highest level of industry recognized commitment to safety and quality, Joint Commission Accreditation for Ambulatory Care Centers. This accreditation was maintained through multiple cycles of inspections and reviews. Additionally, multiple local ultrasound laboratories were accredited by the Intersocietal Accrediting Commission (IAC).

HRU has also been involved in the initiative for education in ultrasound technology. Our initial business venture, *Unique Imaging Solutions Inc.*, conducted Continuing Medical Education (CME) classes for ultrasound and offered a certificate program for Personal Care Aid. The leadership of HRU was instrumental in developing course curricula and content for courses aimed at developing technical standards for ultrasound sonographers. Courses developed were consistently accredited by the Society of Diagnostic Medical Sonographers and awarded CME approval.

HRU's leadership has maintained a reputation for insight and forward thinking. For example, we have made cost saving an important cornerstone of our patient care model. In an age where most imaging companies charge exorbitant fees due to advances in technology, HRU has created industry partners in Picture Archiving Communication Systems (PACS) and Electronic Medical Records (EMR). These relationships have lowered our cost to do business yet enhanced our ability to deliver fast, efficient, and technologically superior results. We can do this, while containing cost and increasing patient safety. Our current model of business practices poises HRU to be area leaders in ultrasound service.

We view our services holistically. Our expert team functions as one cohesive unit, making our business practices the vision for the future. A careful analysis of our proposal will enable the Henrico County Division of Fire to see the clear benefit and value that Hampton Road Ultrasound services will bring.

Hampton Roads Ultrasound is the next generation of diagnostic ultrasound solutions. We optimized our results by continuously refining and re-engineering the core platform that enables our service to influence the future of ultrasound testing. HRU utilizes the leading technological standards and strategies to raise the bar on a rapidly evolving industry.

## **Background**

### **Focus**

Our primary focus is providing quality patient care with exceptional diagnostic ultrasound services. HRU is dedicated to improving the delivery of ultrasound exams. Daily, HRU provides well managed and cost-effective diagnostic ultrasounds for doctors' offices, healthcare facilities and hospitals. We build committed partnerships with local physicians to provide outpatient ultrasound exams. HRU sonographers perform exams in physician offices, nursing homes, hospitals and our ultrasound clinic. Our team is committed to a shared goal to improved patient care delivery.

### **Values**

Our stakeholders and employees will embody our values in every interaction with patients, families, and healthcare professionals. Our values are:

- **Compassion:** We are commitment to patient focused and personable care.
- **Integrity:** We are committed to respecting others and demonstrating ethical practices.
- **Excellence:** We will provide the highest quality patient centered care, while constantly striving to improve.
- **Innovation:** We go above and beyond the norm and will be creative in providing care and solving problems.
- **Teamwork and Collaboration:** We seek to collaborate and form partnerships with our community. We believe everyone is important and is entitled to quality healthcare. HRU attempts to create opportunities for businesses to provide ultrasound screenings and clinics for its patients and employees.

HRU has made strong operational and philosophical commitments to a process of internal and external quality improvement. We will continue to apply quality assurance standards to all our operations. Our quality assurance solution is comprised of integrated modules that align with the American Registry of Diagnostic Medical Sonography (ARMDS), American Board of Radiology (ABR), and American Board of Cardiovascular Medical (ABCM). We have patterned our systems to maximize our flexibility and effectiveness as diagnostic ultrasound providers. We offer expertise and experience with our service and have demonstrated our ability to provide a quality service.

## **Background**

HRU's registered diagnostic ultrasound sonographers, provide comprehensive diagnostic Cardiac, Vascular, General, Obstetric, and Gynecological, ultrasound examinations. They are trained to identify and distinguish organs, tissue, veins and arteries.

### **Vascular Ultrasound Exams**

Vascular Sonographers specializes in evaluating the body's circulatory system. They skillfully use Doppler techniques to evaluate vasculature blood flow in the arteries and veins of the arms, neck, and legs. Vascular Sonographers specialize in helping to identify blockages of the visceral organs, and extremities. They help diagnosis blood vessel abnormalities such as:

Blood clots- Thrombosis (stagnated) or Thromboembolism (mobile) blood mass that forms in veins or arteries causing cramping pain, swelling, chest pain, shortness of breath and possible sudden death.

Carotid Artery Disease-plaque builds up and block normal blood flow in arteries. Results in Carotid Artery Dissection (tear in artery walls causing blood to leak) and Carotid Body Tumors (growth in nerve tissue around artery).

Atherosclerosis- hardening of the arteries due to high cholesterol, high blood pressure, diabetes, smoking, obesity, sedentary lifestyle, and high saturated fat diet.

Chronic Venous Insufficiency-damage valves in the legs block blood flow back to the heart, increasing pressure leg veins resulting in swelling or ulcers.

Deep Vein Thrombosis (DVT)- Blood clot in a vein that causes sudden death if not treated

Carotid Artery Aneurysm- Bulge in an artery supplying blood to the brain leads to a stroke. Symptoms include facial swelling, hoarseness, throbbing neck lump or no symptoms presented.

Peripheral Artery Disease (PAD)- Accumulation of fats and cholesterol, in the arms and legs arteries, blocking blood flow and narrowing arteries that carry nutrients and oxygen to tissues. PAD can cause blockage in the gastrointestinal system, renal and kidney failure, popliteal entrapment syndrome, Raynaud's phenomenon (spasms in finger and toes), and Buerger's Disease (blockage that cause tissue death).

Vascular Disease (Vasculopathy) – Accumulated plaque in the blood vessels that slows down or block blood flow throughout the body that removes waste from tissues.

## **Background**

### **Cardiac Ultrasound Exams**

Cardiac Sonographers specialize in the evaluation of the heart structures. They use a technique called echocardiography, which uses electrodes to exam the heart rhythm and verify the velocity of blood flow. This exam is also commonly used to identify narrowing or blockage of valves in the heart. Cardiac Sonographers help diagnose heart abnormalities such as:

- Deflective heart valves
- Heart failure
- Holes in the wall of the heart chamber
- Enlarged heart- caused by uncontrolled high blood pressure
- Cardiomyopathy- an impairment of the heart muscles
- Pericardial effusion- a collection of fluid within the heart
- Dissection of the aorta- a tearing within the aorta walls.

### **General Ultrasound Exams**

General Ultrasound Sonographers specialize in the evaluation of the abdominal cavity and nearby small organs. They used doppler techniques in diagnostic imaging to identify abnormalities of the kidney, liver, gallbladder, pancreas, spleen, pelvic, thyroid, abdominal aorta, and testicles/scrotum. General Ultrasound Sonographers help detect and differentiate abnormalities which include:

- Tumors
- Cysts
- Uterine fibroids
- Abnormal Thyroid Nodules
- Kidney Stones
- Fluid Retention
- Gallstones
- Gallbladder Polyps
- Enlarged Spleen
- Aorta Dissection
- Aorta Aneurysm

Sonographers are required to document evidence to support physicians' diagnosis and treatment. They are required to integrate medical knowledge of cross-sectional and three-dimensional anatomy, physiology, pathology, and ultrasound physics. They exercise judgement to tailor each examination to the individual's needs.

## **Tab 2**

### **Statement of the Scope**

#### **Introduction**

We understand that Cancers and Cardiovascular disease is a rising crisis within the firefighter community. According to research by the CDC/National Institute for Occupational Health and Safety (NIOSH), Cancer is the most dangerous threat to firefighter health and safety today. Research shows that Firefighters have a 9% higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population<sup>1,3</sup>. Additionally, it accounted for 66% of deaths of firefighters from 2002 to 2019, according to data from the International Association of Fire Fighters (IAFF). Furthermore, cardiovascular events occur among firefighters with underlying cardiovascular disease. In fact, according to one study, sudden cardiac events have consistently accounted for approximately 50% of duty-related deaths among firefighters over the last decade<sup>2</sup>. A retrospective study examining all available autopsies from firefighter fatalities over the past 20 years found that 80% of cardiac-related fatalities had both coronary heart disease and a structurally enlarged heart (cardiomegaly and/or left ventricular hypertrophy)<sup>4</sup>. Multiple research findings suggest that preventive measures and entry-level medical evaluations are beneficial to detecting risk of on-duty sudden cardiac death (SCD)<sup>5</sup>.

The Henrico County Division of Fire seeks to provide an effective means of detecting cancer and cardiovascular disease in its workforce. This RFP requests a service for fire fighters that will assist in detecting diseases early. Statistics show that screenings help improve the outcomes of cancer and cardiovascular disease and decrease morbidity and mortality. Hampton Roads Ultrasound (HRU) can provide a uniquely tailored screening that is reliable and flexible. Our service will provide accommodate 638 or more firefighters for ultrasound screenings within a year. We will provide licensed ultrasound sonographers that will conduct, at a minimum, testing that evaluates, the carotid circulation, abdominal aorta for aneurysm, heart and valve function, thyroid, abdominal organs, bladder, testicles, and pelvic contents and accurately find and document the presence or absence of tumors and cardiovascular disease.

HRU will provide all materials and personnel, including physicians, sonographers, nurse practitioners, physician assistants, and ancillary personnel required to complete this project within one year. We will also utilize licensed medical professionals to provide results to the participants with follow-up recommendations, within one week. Consulting physicians will encourage these participants to contact primary care physician for continuity of care. Hampton Roads Ultrasound will provide aggregate results comparing its findings to current industry data. We will fulfill the requirements of this RFP with all state and federal guidelines for privacy and information storage.

Hampton Roads Ultrasound's goals are to provide Henrico County Division of Fire with safe and reliable ultrasound screenings, licensed proficient staff, and easily accessible final reports. We are willing and able to provide on-site screenings on multiple days per week on a rotating schedule.



### **Tab 3**

#### **Qualifications, Experience, References**

Hampton Roads Ultrasound is qualified and readily available to provide Henrico County Division of Firefighters an expert leadership team with qualified sonographers that will exceed industry expectations.

#### **Qualifications, Experience, References**

##### **Fort Norfolk Medical, Norfolk VA (2012-current)**

Hampton Roads Ultrasound has the unique capability of providing equipment and staff to satisfy the demands of busy practices and improve the quality of care delivered.

Keith Newby, M.D., a well-known cardiologist in Norfolk, VA, and owner of Fort Norfolk Medical, sought the leadership of Hampton Roads Ultrasound to establish a peripheral vascular lab. HRU created a continuing education curriculum that trained registered sonographers in advanced ultrasound techniques. We also created protocols for the lab testing. We provided this busy office with general ultrasound examinations daily, thereby allowing him to extend the quality of care as a cardiologist. The expansion of services gave him the ability to monitor the effect of chronic disease and provide quicker diagnosis and treatment. Hampton Roads Ultrasound also introduced a new Picture Archiving and Communication System (PACS) and reporting software. The implementation of the new PACS system allowed Fort Norfolk Medical to easily access digital images, making interpretation faster and more accurate. Additionally, it allowed remote access for several physicians to provide integrative care.

##### **East Cardiovascular Services, Norfolk, VA (2012-2022)**

Hampton Roads Ultrasound has the unique capability of providing equipment and staff to satisfy the demands of busy practices and improve the quality of care delivered.

Mark East, MD, a cardiologist and owner of East Cardiovascular Services, treats patients with peripheral vascular disease. Dr. East sought the leadership of Hampton Roads Ultrasound to establish a peripheral vascular lab. We provided this busy office with vascular sonographers, thereby allowing him to extend the quality of care as a cardiologist. The expansion of services gave him the ability to diagnose and treat diseases of the lower extremities, kidneys and cerebrovascular system. Hampton Roads Ultrasound also introduced a new Picture Archiving and Communication System (PACS). The implementation of the new PACS system allowed this office to easily access digital images. Access to reports allowed for improvement in the initiation of treatment plans. Additionally, it allowed remote access for several physicians to provide integrative care.

### **Tab 3**

### **Qualifications, Experience, References**

#### **Hampton Roads Ultrasound Education and Medical Certifications (2012-current)**

Hampton Roads Ultrasound provides continuing education to vascular and general sonographers. We have developed a comprehensive curricula and training program for ultrasound sonographers' continuing education. We offer several in-person, hands on laboratory training and seminars. Our certification courses are guided by the Society of Diagnostic Medical Sonographers (SDMS). Each training session has gained recognition for continuing medical education (CME). These courses have been designed to educate sonographers on abdominal ultrasound and peripheral vascular ultrasound techniques.

HRU courses remediate, train, and prepare registered sonographers for new responsibilities and opportunities. Our CME courses provide participants with up to 24 hours of credit toward license renewals.

#### **Warwick Boulevard Physicians, Newport News, VA (2012-current)**

Hampton Roads Ultrasound (HRU) provides outpatient ultrasound services for several physicians at Warwick Boulevard Physician's office. Our sonographers provide them with over 300 ultrasounds annually. Our exams support their practitioners' goals to provide prompt diagnosis, treatment, and disease tracking for their patients. For ten years, our services have conveniently provided a cost-effective option for the patients of this facility. In addition, our services have helped improved their patient satisfaction and provide faster diagnosis.

Registered sonographers are proficient at providing abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at providing obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. HRU has become the number one choice for individuals without insurance or unable to afford the rising cost of insurance deductibles. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

### **Tab 3**

### **Qualifications, Experience, References**

#### **Chesapeake Community Health Center, Chesapeake VA (2012-current)**

Hampton Roads Ultrasound (HRU) provides outpatient ultrasound services for Chesapeake Community Health Center. This health center desired a solution to bridge the gap of comprehensive healthcare and affordable ultrasound exams. To satisfy their mission, we have partnered with the community center to provide, vascular, gynecologic and obstetric ultrasound services. HRU's leadership has built a healthy working relationship with Chesapeake Community Health Center for over ten years. Our cost-effective solutions, convenient facility and high-quality service has helped to maintain this relationship.

Our facility and staff have become a liaison between patients and doctors. HRU's skilled sonographers provide high quality abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. HRU has become the number one choice for individuals without insurance or unable to afford the rising cost of insurance deductibles. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

#### **Portsmouth Community Health Center, Portsmouth, VA (2012-current)**

Portsmouth Community Health Center (PCHC) is a community health center that services Portsmouth, VA. As a part of the Virginia Healthcare Association this center provides care for migrants, homeless, low socioeconomic status. With the assistance of Hampton Roads Ultrasound, the PCHC was able to bridge gap between high quality care and affordable ultrasound exams. To satisfy their mission, we have partnered with the community center to provide, vascular, gynecologic and obstetric ultrasound services. HRU's leadership has built a healthy working relationship with Portsmouth Community Health Center for over ten years. Our cost-effective solutions, convenient facility and high-quality service has helped to maintain this relationship.

Our facility and staff have become a liaison between patients and doctors. HRU's skilled sonographers provide high quality abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. HRU has become the number one choice for individuals without insurance or unable to afford the rising cost of insurance deductibles. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

### **Tab 3**

### **Qualifications, Experience, References**

#### **48<sup>th</sup> Street Physicians, Newport News, VA (2012-current)**

48<sup>th</sup> Street Physicians is a medical practice located in Newport News, VA. Hampton Roads Ultrasound (HRU) provides outpatient ultrasound services for this practice. They deliver high quality medical services to the uninsured and under-insured residents of Newport News, VA. As a part of the Virginia Healthcare Association, their mission is to provide a better way to care. HRU supports this mission by fulfilling physician needs for reliable diagnostic testing. We are able to provide vascular, gynecologic and obstetric ultrasound services. HRU's leadership has built a healthy working relationship with Chesapeake Community Health Center for over ten years. Our cost-effective solutions, convenient facility and high-quality service has helped to maintain this relationship.

Our facility and staff have become a liaison between patients and doctors. HRU's skilled sonographers provide high quality abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. HRU has become the number one choice for individuals without insurance or unable to afford the rising cost of insurance deductibles. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

#### **Main Street Physicians, Suffolk, VA (2012-current)**

Main Street Physicians is a medical practice located in Suffolk, Virginia that provides care to rural residents. These patients often lack access to necessary diagnostic services. The goal of Main Street Physicians is to increase access to quality healthcare. HRU supports this goal by providing outpatient diagnostic ultrasound services. Our services deliver affordable care that is also convenient. We were able create a relationship to perform obstetric and gynecological ultrasound examinations for a fraction of the cost incurred at hospitals.

HRU is able to provide OB, general ultrasound, and vascular ultrasound services to individuals without insurance. Our relationship with Main Street Physicians has flourished for many reasons including price, convenience, and quality of service. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

### **Tab 3**

### **Qualifications, Experience, References**

#### **Virginia Beach Family Medicine Center, Virginia Beach, VA (2020-current)**

Virginia Beach Family Medicine Center is a medical practice located in Virginia Beach, Virginia. Their goal is to have a convenient service accessible to patients. Their mission is to provide a multidisciplinary approach to patient care. HRU serves as an integral part in the delivery of care by facilitating high quality diagnostic information for healthcare professionals. HRU's leadership has built a healthy working relationship with Virginia Beach Family Medicine Center for over five years. Our cost-effective solutions, convenient facility and high-quality service has helped to maintain this relationship.

Our facility and staff have become a liaison between patients and doctors. HRU's skilled sonographers provide high quality abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. HRU has become the number one choice for individuals without insurance or unable to afford the rising cost of insurance deductibles. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

#### **East Oceanview Medical Center, Norfolk, VA (2020-current)**

East Oceanview Medical Center is a medical facility located in Norfolk, Virginia. Its primary focus is to provide healthcare access to underserved populations throughout the East Oceanview area. They serve a diverse population including individuals for whom English is a second language. They sought to collaborate with Hampton Roads Ultrasound to provide outpatient ultrasound services.

HRU's skilled sonographers provide high quality abdominal, thyroid, uterine, ovarian, and pelvic ultrasounds. They are also adept at obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability, and determining pelvic disease and abdominal organ abnormalities. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

### **Tab 3**

### **Qualifications, Experience, References**

#### **Lake Taylor Transitional Care Hospital (2012-current)**

Lake Taylor Transitional Care Hospital is a 200 bed post-acute hospital located in Norfolk, Virginia. Hampton Roads Ultrasound provides onsite ultrasound testing for its rehabilitation and acute care patients. We meet patients where they are. HRU sonographers administer patient exams in the convenience of their room. This service allows bed ridden patients the luxury of bedside care, in addition, it improves urgency of care, decreases transportation and increases patient satisfactions. We provide ultrasound machines and licensed sonographers to perform diagnostic exams. HRU communicates with the Quality Development Department on a weekly basis to establish a patient schedule. Our sonographers perform examinations in the convenience of the patient's room specific to the orders from facility physicians. At the conclusion of each examination, sonographers leave a written report of all findings. Results with significant findings are communicated directly to the ordering physician, this improves the speed at which providers can implement care plans. We utilize digital imaging to complete examinations; these images are transmitted to our reading radiologist. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the Quality Development Department.

#### **Select Riverside Rehabilitation Hospital (2012-current)**

Select Riverside Rehabilitation Hospital is a rehabilitation center located in Yorktown, Virginia. This facility focuses on post-acute care. They specialize in orthopedic, neurological, amputee, spinal cord, stroke, and medically complex rehabilitation. Hampton Roads Ultrasound provide onsite ultrasound exams for this hospital. HRU sonographers administer patient exams in the convenience of their room. This service allows bed ridden patients the luxury of bedside care, in addition, it improves urgency of care, decreases transportation and increases patient satisfaction. We provide ultrasound machines and licensed sonographers to perform diagnostic exams. HRU communicates with the nursing staff on an as needed basis to establish a patient schedule. Our sonographers perform examinations in the convenience of the patient's room specific to the orders from facility physicians. At the conclusion of each examination, sonographers leave a written report of all findings. Results with significant findings are communicated directly to the ordering physician, this improves the speed at which providers can implement care plans. We utilize digital imaging to complete examinations; these images are transmitted to our reading radiologist. Final reports are generated within 24-48 hours and are transmitted via HIPPA compliant fax to the nursing staff.

### **Tab 3**

### **Qualifications, Experience, References**

#### **Peninsula Institute for Community Health (PICH)-Women's Health (2012-current)**

Since 2012, Hampton Roads Ultrasound (HRU) has partnered with The Peninsula Institute for Community Health (PICH), women's health division, to provide level one OB ultrasound services. Our cost-effective prices have made ultrasound services available to uninsured pregnant women. HRU sonographers are skilled at providing obstetric ultrasounds for the determination of fetal gestational age, morphology, and viability.

Hampton Roads Ultrasound also provides abdominal, thyroid, uterine, ovarian, pelvic, and vascular ultrasound services for the Peninsula Institute for Community Health. All services are provided in our comfortable, relaxing ultrasound facility, located in Chesapeake, Virginia. We use the most updated digital imaging machines by General Electric (GE). HRU conveniently receives physician referrals through our secure medical fax and provides final reports through our electronic medical records system.

#### **City of Norfolk (2004-2006)**

Hampton Roads Ultrasound administered preventive health screenings for Norfolk Public Schools and the Department of Public Works for two years. HRU educated employees about the signs and symptoms of peripheral vascular disease (PVD). We also performed health risk assessments and conducted cardiovascular screenings for employees.

HRU's screenings were offered to help lower the out-of-pocket costs for City of Norfolk employees. Each employee received various screenings that included peripheral arterial disease, carotid artery stenosis and abdominal aorta aneurysm.

#### **Chesapeake Public Schools, Contractor (2004-2006)**

Hampton Roads Ultrasound administered preventive health screenings for Chesapeake Public Schools' approximately 7500 employees for two years. HRU educated employees about the signs and symptoms of peripheral vascular disease (PVD). We also performed health risk assessments and conducted cardiovascular screenings for employees.

HRU's screenings were offered to help lower the out-of-pocket costs for Chesapeake Public School employees. Each employee received various screenings that included peripheral arterial disease, carotid artery stenosis and abdominal aorta aneurysm.



### **Tab 3**

## **Qualifications, Experience, References**

### **Chesapeake Vein Center and Med Spa, Chesapeake, VA (2004-2006)**

Hampton Roads Ultrasound has the unique capability of providing equipment and staff to satisfy the demands of busy practices and improve the quality of care delivered.

Surya Challa, MD, a general surgeon and owner of Chesapeake Vein Center and Med Spa, treats patients with venous vascular disease. Dr. Challa sought the leadership of Hampton Roads Ultrasound to establish a peripheral vein lab and assist in surgical procedures for the correction of venous disorders. We provided this busy office with vascular sonographers, thereby allowing him to extend the quality of care as a general surgeon. The expansion of services gave him the ability to diagnose and treat venous diseases of the lower extremities.

### **Chesapeake Regional Medical Center, Contractor (2002-2011)**

Hampton Roads Ultrasound is the only Independent Diagnostic Testing Facility to provide Chesapeake Regional Medical Center with an accreditation with the Intersocietal Accreditation Commission of Vascular Labs. HRU provided new reporting software protocols that successfully minimized billing discrepancies and improved patient wait times for ultrasound services.

HRU provided Chesapeake Regional Medical Center (CRMC) with licensed, experienced, and reliable sonographers. We were responsible for the research and integration of peripheral vascular lab reporting software. We also created ultrasound testing protocols for standardized lab testing and improving accuracy. Hampton Roads Ultrasound was instrumental in providing the policies and procedure for CRMC lab operations. Additionally, we developed interdepartmental policies to monitor the effectiveness of the software.

Under the leadership of Hampton Roads Ultrasound, patient volume increased from approximately 7,000 patients yearly to more than 8,500 patients within two years of contract initiation. Quality measures were consistently in 90% agreement with angiography across all modalities of ultrasound. We also provided all services within the hospital's operational budget.



### **Tab 3**

## **Qualifications, Experience, References**

### **Mary Immaculate Hospital, Contractor (2002-2011)**

Hampton Roads Ultrasound (HRU) is recognized as an Independent Diagnostic Testing Facility (IDTF). From 2002 to 2011 HRU established peripheral vascular labs for Mary Immaculate Hospital. Referring physicians has developed fledgling labs into efficiently run, accredited centers.

HRU provided Mary Immaculate Hospital (MIH) with licensed, experienced, and reliable sonographers. We were responsible for the research and integration of peripheral vascular lab reporting software. We also created ultrasound testing protocols for standardized lab testing and improving accuracy. Hampton Roads Ultrasound was instrumental in providing the policies and procedure for MIH lab operations.

Within the first year of operations, HRU successfully established correlation programs that exceeded industry standard rate of 80% agreement between ultrasound and angiography. This was instrumental in building a reputable lab and subsequently obtaining Intersocietal Commission of Accreditation recognition.

We continued this cycle of success for 6 years. Under Hampton Roads Ultrasound leadership, the laboratory increased revenue by introducing new service lines that improved patient care and physician satisfaction. We positively affected patient volume by increasing patient referrals from approximately 2000 patients seen annually to exceeding 4000 patient visits annually by year 3 of the contract.

### **Community Education and Screening for local churches (2001-current)**

Hampton Roads Ultrasound currently provides peripheral vascular disease screenings for several religious institutions in Norfolk, Portsmouth Suffolk and Chesapeake. HRU educated participants about the signs and symptoms of peripheral vascular disease (PVD). We also performed health risk assessments and conducted cardiovascular screenings for participants. As a leader in cardiovascular health and screenings, we provided health seminars at community health fairs.

Currently we participate in various health seminars and screenings for churches, businesses, and community organizations throughout Hampton Roads. We provide screenings that included peripheral arterial disease, carotid artery stenosis and abdominal aorta aneurysm, additionally, we have available thyroid, bladder, testicular, pelvic and echocardiogram.

## **Tab 3**

### **Qualifications, Experience, References**

#### **Summary of Experience**

Hampton Roads Ultrasound's strength is in its leadership, technical expertise, infrastructure, and support system; our people make us unique and uncharacteristically equipped to satisfy your needs. HRU has spent more than a decade developing affiliations and working with physicians and hospitals. Our exceptional service, reliability, trustworthiness and dependability have been an important part of us maintaining long standing relationships.

Our experience has helped us to recognize problems, develop change strategies and successfully implement those strategies, when needed. Additionally, Hampton Roads Ultrasound is well experienced in providing outpatient services. We have the facilities and staff in place to meet the demands of clients.

HRU sonographers are well trained and licensed. Our partners in healthcare consists of several area Radiologists, Cardiologists, Vascular and General surgeons. Collectively our physician network has over a half century of experience in modalities of ultrasound. Our in-depth resources add to our uniqueness and preparedness to fulfill the needs of this RFP.

## **Tab 3**

### **Qualifications, Experience, References**

#### **Key Personnel**

#### **Resumes are in Appendix E**

##### **Chief Executive Officer**

Ayisha Buggs is the senior manager for Hampton Roads Ultrasound. She has a Master of Art in Urban Affairs and Counseling and is an essential component to running our daily operation. Ms. Buggs is responsible for making decisions and setting the vision and goals for HRU. She is the primary business contact and is responsible for all client communications, conflict resolution, and policy compliance. Ms. Buggs ensures that the company is following all applicable laws, rules, regulations, and standards.

##### **Operating Officer/ Physician Assistant**

Alphonzo Smalls is a practicing Physician Assistant with numerous healthcare experience. He has earned a medical degree, in Physician Assistance from Eastern Virginia Medical, in Norfolk VA. and Sonography degree in Vascular Sonography from School of Sentra Health Professions. In addition to providing daily healthcare, in internal medicine, Mr. Smalls is a liaison for the reading physicians, nurse practitioner and lead sonographer. He routinely evaluates operation procedures and manage financial implications for HRU.

##### **Physician Director**

Hampton Roads Ultrasound's physician director is Dennis Walker, MD. Dr. Walker is a practicing board certified Radiologist in Virginia. He has worked with Hampton Roads Ultrasound since 2016. He is responsible for overseeing the quality of our ultrasound facility and has the duty of reading ultrasound studies. Dr. Walker has achieved the certification in Radiology for Diagnostic Radiology by the American Board of Radiology. He is essential to ensuring we meet the Standards and Guidelines of the American College of Radiology.

##### **Interpreting Physicians**

Our reading physicians are licensed medical practitioner with a thorough understanding of ultrasound sonography. Dennis Walker, DO, a Radiologist, is certified by the American Board of Radiology, Joseph Freedman, MD, Keith Newby, MD and Mark East, MD are practicing Cardiologists licensed in the state of Virginia. They have been our partners in healthcare for over 15 years. They are familiar with the principles of ultrasound technology and meet the certifications required by American Board of Cardiovascular Medical.

HRU reading physicians are fully licensed for interpreting cardiac, vascular, and general ultrasound exams. They exceed the requirement of 300 annual ultrasound procedures a year.

## **Tab 3**

### **Qualifications, Experience, References**

#### **Key Personnel**

##### **Nurse Practitioner**

Chiqilla Moore, NP, is a practicing nurse practitioner who provides medical care and management for critical care patients. Ms. Moore is licensed by the Virginia Board of Medicine and has several years of experience in patient care. She collaborates closely with all team members to provide optimal service. Ms. Moore is also one of our team's patient liaisons. She is responsible patient's consultations and for tracking chronic diseases for the analysis of statistical data.

##### **Chief Technology Engineer**

Ayanna Smalls is a graduate of Old Dominion University with a Bachelor of Science in Computer Engineering. Ms. Smalls has been instrumental in creating and maintain our information technology infrastructure. For 2 years she assisted with information transfer and storage ensuring our network runs smoothly and troubleshooting problems involving equipment. She is responsible for coordinating machine maintenance, annual quality control checks and performs routine machine maintenance checks. Ms. Smalls performs routine machine maintenance checks and schedules yearly preventive maintenance.

##### **Lead Sonographer**

Randall Henciak, RVT, RDMS is the lead sonographer at Hampton Roads Ultrasound. Mrs. Henciak is a diagnostic sonographer registered in Vascular, General, and OB/GYN. She has been employed with HRU since 2017. As our lead sonographer she educates and consults daily with our technologist team. She is responsible for guaranteeing accurate image reporting and ensuring that safety and quality assurance is met.

##### **Vascular and General Ultrasound Sonographers**

For patient convenience, HRU is consistently staffed with several fully registered ultrasound sonographers. Our ultrasound sonographers are licensed by the professions' governing bodies, American Registry of Diagnostic Medical Sonography and/or American Registry of Radiological Technologist, with an endorsement in diagnostic Cardiac, Vascular, General and OB/GYN imaging.

All employees are required to be licensed in their respective imaging specialty. Company policy dictates that all employees also maintain certification. All employees are insured under HRU's blanket policy. Contractor with work with HRU are all required to carry malpractice and liability insurance in accordance with Virginia law.

### **Tab 3**

### **Qualifications, Experience, References**

Sugar-Marie Robinson  
East Cardiovascular Services  
Administrator  
[sroberts@eastcardiology.com](mailto:sroberts@eastcardiology.com)  
757-222-0012  
10 years

Peggy Newby  
Fort Norfolk Cardiology Associates  
Chief Office Administrator  
[pnewby@fnpma.com](mailto:pnewby@fnpma.com)  
757-624-1785  
10 years

Carole Evans  
Lake Taylor Transitional Care Hospital Quality Development  
Director of Quality Development  
757-461-5001

Daniel Ballin  
Select Riverside Rehabilitation Hospital  
Chief Administrator  
[dballin@selectmedical.com](mailto:dballin@selectmedical.com)  
757-272-9650  
5 years

Tonya Grady  
Southeastern Virginia Health Systems  
757-952-0171  
10 years

48<sup>th</sup> Street Physicians  
Wilma Valesquez  
757-380-8709

Portsmouth Community Health Center  
Latonya Weatherly  
757-393-6363

### **Tab 3**

#### **Qualifications, Experience, References**

Sherwood Moore  
Chesapeake Regional Medical Center  
Cardiovascular and Bariatric Service Line Administrator

[Sherwood.moore@chesapeakecentral.com](mailto:Sherwood.moore@chesapeakecentral.com)

757-312-5250

5 years

## **Tab 4**

### **Service Approach and Methodology**

Hampton Roads Ultrasound (HRU) is an independent diagnostic testing facility that provides healthcare screenings and full service cardiovascular, general, and obstetric/gynecological ultrasound testing. HRU is able to provide a team of licensed sonographers for echocardiography, vascular, and general ultrasound screenings. As an added resource, we provide a team of certified phlebotomists for hematologic and urinalysis lab testing. Our team of physician partners includes board certified radiologists, cardiologists, nurse practitioners, physician assistants, and nurses. All medical professionals are licensed to practice in the State of Virginia and can demonstrate the skills and knowledge necessary for their profession.

Ultrasound screening is a non-invasive examination that uses handheld ultrasound probes and hypoallergenic gel that is placed on the body. The probes create sound waves that generate real time images of internal organs. Examinations may require special preparation including, fasting, ingesting water or exposure of various body parts. Each participant will be given specific instructions before the screening.

Hampton Roads Ultrasound will perform all screenings at a location determined by the Henrico County Division of Fire. HRU sonographers and staff will set up the examination area needed for each screening. We will also provide the necessary materials to successfully complete all duties. These materials include portable stretchers, ultrasound machines, software, drape cloths, robes, disinfectant cleansers, privacy screens, iPads, and specialized disposable containers. At the end of each day, HRU employees and staff will remove all items related to screenings. We are prepared to provide screenings on a rotating basis to ensure all fire fighters can receive this service. HRU is also prepared to provide multiple days per week, on a mutually agreeable schedule, to ensure that every fire fighter and extended staff are seen within the year.

Hampton Roads Ultrasound will provide a secure, HIPAA compliant registration process. An online portal will be made available as a shareable link for pre-registration. Participants will be encouraged to pre-register online before their appointment. The registration will require demographic information, a simple medical history, and a consent form. In addition, we encourage all participants to add their primary care provider's information, in case of consultation. See **Appendix F** for sample form.

Once registered, participants will be contacted directly by our administrator for scheduling. We anticipate that each screening test will take 10 minutes to obtain key measurements and images. Each appointment will be allotted 75 minutes for evaluation. Special preparations will be explained at the time of scheduling. A text message will be sent to each participant to remind them of their appointment time, location, and special testing preparation.

## **Tab 4**

### **Service Approach and Methodology**

Screenings will begin with Hampton Roads Ultrasound staff setting up scanning areas. HRU staff will arrive at least thirty minutes prior to the first scheduled screening. Staff will include General, Vascular, Echocardiography sonographers, and a medical assistant. We can provide a team of certified phlebotomists for hematologic and urinalysis for cancer screenings, if needed. The medical assistant will record blood pressures, ensure identity of participant, and answer general questions about procedures. Sonographers will answer details about the performance of each exam. There will be two scanning stations set up with privacy partitions, stretchers, table paper for covering the stretcher after each patient, drape clothes, all disinfecting supplies needed, gloves, probe covers, and other required personal protective equipment.

Detailed protocols have been developed to record specific data points accurately. See **Appendix G** for detailed protocols for each screening and detailed explanation of significant findings. Protocols were developed to mimic guidelines for extended/complete examinations from the Intersocietal Commission for the Accreditation of Vascular Laboratories and the Intersocietal Commission for the Accreditation of Echocardiography Laboratories. Specialized software is used to immediately report abnormal findings. This brings urgency to atypical preliminary results. These reports are transferred with the images to the reading physician.

Results are electronically transmitted at the conclusion of each exam to our team of interpreting physicians. Information is sent via HIPAA compliant electronic transfer with strict industry standard security protocols to our online PACS (Picture archiving and Communication System). This improves efficiency and gets results to reading physicians quickly.

Upon completion of examinations, the participants will be given the opportunity to ask questions. Sonographers can answer certain technical questions, but are unable to provide diagnoses. They are also responsible for cleaning sanitizing all equipment used after exams with hospital grade cleaning solution. This prevents cross contamination and infection. HRU is compliant with National Patient Safety Goals which include hand washing, or alcohol cleansing, before and after examinations.

At the conclusion of the daily screening services. The HRU team will remove all equipment owned by the company and remove debris from premises until the next agreed upon screening date. HRU employees will leave the site as they found it free of any debris associated with the performance of the medical services performed.

Hampton Roads Ultrasound requires that all exams be evaluated by board certified radiologists and cardiologists. Final interpretations are created then released to the physician assistant or nurse practitioner to review and communicate abnormal results.



## **Tab 4**

### **Service Approach and Methodology**

Consultation for abnormal results occurs within 48-72 hours of testing. All participants will receive a secure login via email that will allow them to view results in our secure Picture Archiving and Communication System (PACS). The secure login will be available for one year to view and print results.

## **Tab 4**

### **Service Approach and Methodology**

#### 3. Cancer and Cardiovascular Screenings

##### a. Carotid Screening

Carotid screenings are designed to detect plaque development in carotid arteries that can result in cerebrovascular accidents (Stroke) and Transient Ischemic Attacks (TIA/Mini stroke). Plaque development in the carotid arteries can form in the walls of the vessels that supply blood to the brain. A detailed carotid ultrasound exam can identify structural and blood flow abnormalities. Sonographers are trained at measuring detailed cross sectional and longitudinal images to accurately depict pathology or the lack thereof. Images are obtained in grayscale color doppler. Three dimensional images can be taken to give a more complete depiction of masses discovered. We utilize Logiq E and Vivid I digital ultrasound machines.

In the International Journal of Environmental Research and Public Health out of almost 5,300 firefighter participants, 69% met the criteria for hypertension<sup>3</sup>. American Heart Association research from 2021, showed that fire fighters had a high risk of atherosclerotic heart disease<sup>8</sup>. Furthermore, a 2011 study indicated that cardiovascular disease was the leading cause of on-duty death among firefighters at 45% and a major cause of morbidity<sup>9</sup>. Carotid screenings have the ability for early detection of undiagnosed abnormalities. Tumors can develop near the carotid arteries called carotid body tumors. Neck pathology may also include enlarged lymph nodes.

The participant will be required to expose the neck on both sides. An ultrasound probe will be moved along the side of the neck to evaluate the carotid arteries.

## **Tab 4**

### **Service Approach and Methodology**

#### **b. Abdominal Aortic Aneurysm AAA**

The abdominal aorta ultrasound screenings evaluate the risk of abdominal aorta aneurysm and potential aorta tumors. This exam surveys the abdomen from the sternum to the pelvis and bifurcation of the abdominal aorta. Sonographers measure several detailed cross-sectional areas to accurately depict pathology or the lack thereof. Industry standard requires that images are obtained in grayscale and with color doppler. Three dimensional images can be taken to give a more complete depiction of masses discovered. We utilize Logiq E and Vivid I digital ultrasound machines.

Rare tumors may originate from the aorta walls. The aorta wall may become weakened by undiagnosed, or under treated hypertension, causing a bulging of the wall and loss of tensile strength of the aorta resulting in an aneurysm. The developed aneurysm can grow and eventually rupture creating a surgical emergency. Oftentimes there are no clear indications of the presence of an abdominal aorta aneurysm, except for vague backpain that is commonly ignored. US Preventive Services Task Force, shows evidence proving that ultrasound exams have a greater than 94% accuracy in finding aorta aneurysms<sup>10</sup>.

The participant will be required to expose the abdomen. A drape will be placed on the lower half of the abdomen. An ultrasound probe will be moved along the length of the abdomen to assess the aorta.

#### **c. Echocardiogram (Valve function, Heart Pumping Ejection Fraction,)**

An echocardiogram is an ultrasound of the heart that helps diagnose damaged cardiac tissue and heart chamber enlargement. It can also detect fluid around the heart and poorly functioning heart valves as well as abnormal masses in the heart muscle. Damaged tissue can lead to decreased pumping capacity of the heart causing congestive heart failure, blood clots in the heart, or enlarged chambers of the heart. Hampton Roads Ultrasound will perform the transthoracic screening echocardiogram to detect these abnormalities.

The National Fire Protection Association reported that 44% of on duty fire fighter fatalities during a ten-year period (1995-2004) were due to sudden cardiac death. Additionally, firefighter occupational cancer is also the leading cause of deaths in firefighters in 2022. In 2002, a Boston firefighter was treated for cancerous tumors in the lining of his heart due to exposure to burnt carcinogens.

The participant will be required to remove their shirt, a drape will be placed over the chest for privacy. Gel will be placed on the chest. An ultrasound probe will be moved along the left side of the chest and under the breast.

## **Tab 4**

### **Service Approach and Methodology**

#### **d. Thyroid**

A systematic review study showed that firefighters are at a high risk for development of thyroid cancers. Female firefighters are three times more likely to be diagnosed with thyroid cancer than the general population, according to the International Association of Firefighters. The thyroid gland is vital in controlling metabolism, breathing and heart rate. A thyroid ultrasound is used to evaluate the soft tissue and vasculature of the gland. Ultrasound has proven to be important in the detection of abnormal thyroid lesions. A detailed analysis of tissue density has been shown to have a greater than 95% accuracy at detecting malignancy<sup>11</sup>. Multiple longitudinal and cross-sectional images are used to assess the thyroid and suspicious tumors and cysts.

The participant will be required to expose the neck on both sides. An ultrasound probe will be moved along the side of the neck to evaluate the thyroid gland.

#### **e. Abdominal - liver, gall bladder, kidneys, and spleen**

The abdomen provides the largest opportunity for the development of pathology. The abdominal organs are often either the origin of cancerous lesions or the direct target of metastasis. It is important that each organ is surveyed in its entirety. In an abdominal complete ultrasound, all organs are identified and surveyed in multiple planes of view, color flow doppler is also used to evaluate masses.

Stomach cancer is the 5<sup>th</sup> most common cancer in the United States. Almost 26,000 new cases are identified each year according to the Cancer Treatment Center of America. Risk factors like smoking and obesity may increase the risk for disease. According to the leukemia and lymphoma society, a 2019 study published, that firefighters have a higher exposure to burnt carcinogens such as synthetic material, asbestos, and diesel exhaust. These factors contribute to increased rates of abdominal cancers.

The participant will be required to expose the abdomen. A drape will be placed on the lower half of the abdomen. An ultrasound probe will be moved along the length and the sides of the abdomen.

## **Tab 4**

### **Service Approach and Methodology**

#### f. Bladder Ultrasound

According to the American Urological Association, firefighter exposure to carcinogens increases the concentrations of chemicals in the urine. This damages the bladder inner lining and increases the likelihood of developing transitional cell carcinoma. Ultrasound can evaluate the lining of the bladder and the musculature of the organ to determine if there are tumors, cysts or obstructive stones. A study in the Journal of Family Medicine supports the advantages of non-invasive diagnostic ultrasound in finding bladder cancers. Additionally, their research indicates that ultrasound has a 93% sensitivity, 100% specificity and 100% positive predictive value in detecting bladder cancer<sup>12</sup>.

The participant will be required to expose the abdomen. A drape will be placed on the lower half of the abdomen. An ultrasound probe will be placed on the lower portion of the pelvis to evaluate the bladder.

#### g. Testicular - men

An ultrasound is often the first test performed to evaluate the possibility of testicular cancer. Ultrasound is instrumental in detecting lesions in the testicle. According to the International Brazilian Journal Urology, ultrasound remains effective in detecting masses with almost 100% sensitivity for benign lesions, and greater than 90% sensitivity and specificity for detecting malignancy<sup>13,14</sup>. Data from National Institute for Occupational Safety and Health (NIOSH) indicates that firefighters are 100 times more likely to develop testicular cancer than the general population. This test is intensely sensitive for the participant and require complete privacy as the client will be required to disrobe and expose the scrotum. The test is fully explained prior to disrobing and only the scrotum is exposed for this exam. Imaging includes multiple views in the transverse and longitudinal and oblique planes to evaluate the testicle with color doppler imaging as well. Measurements of the size of the scrotum and any abnormalities are recorded and communicated to the reading radiologist.

## **Tab 4**

### **Service Approach and Methodology**

#### **h. Pelvic – women**

Female firefighters have a 4 times higher risk for cervical cancer than the general public. Endometrial cancer is the most commonly diagnosed gynecologic cancer. According to Cancer Net, about 65,950 American women were diagnosed with the disease this year <sup>6</sup>. Endometrial cancer is also the most common form of uterine cancer, so it is frequently referred to as uterine cancer. The pelvic ultrasound consists of an evaluation of the uterus and ovaries. This pelvic exam can be performed via transabdominal or transvaginal approach. Transabdominal abdominal exams do not require disrobing, while the transvaginal does.

The transvaginal ultrasounds are more commonly used to evaluate the endometrium, uterus and ovaries. This exam is capable of providing a detailed view of these pelvic contents. The transvaginal pelvic ultrasound also provides greater flexibility in measuring larger cysts or masses. We understand the sensitivity of the pelvic exam, therefore they are performed by female sonographers. Sonographers use probes covered with a protective sheath for each exam. A wand-like instrument called a transducer is inserted into the vagina, the signals produce a real-time visual image of pelvic organs. Probes are cleansed with medical grade disinfectant and virucidal solution. According to the American College of Gynecology, transvaginal ultrasound has been shown to have a 99% predictive value for endometrial cancer <sup>15</sup>. The **transabdominal pelvic ultrasound** involves moving a specialized transducer, outside the body, across the lower half of the abdomen and pelvis. A transabdominal exam provides a view of the pelvic organs, but there may be limitations in measuring cysts and masses.

## **Tab 4**

### **Service Approach and Methodology**

i. Additional Services

a. Ankle Brachial Index

- i. The ankle Brachial Index (ABI) is a helpful diagnostic tool to evaluate blood flow in the lower extremities. This exam offers valuable information about peripheral arterial disease. The ABI test involves obtaining blood pressures on the arms and legs then comparing the ratio to determine the presence of atherosclerotic plaque. Determining presence of peripheral arterial disease can indicate the likelihood of having a coronary event.

b. Phlebotomy/Lab analysis

Hampton Roads Ultrasound can combine blood analysis with imaging to aid in diagnosis and treatment of potential pathology. The following blood tests are useful in helping detect cancer:

- i. CBC- Can indicate lymphatic cancers
- ii. CA 125 – Tests for ovarian cancer
- iii. CEA – Tests for colorectal cancer
- iv. CA 19.9 Tests for gastric/pancreatic or stomach cancer
- v. PSA – Can detect possible prostate cancer
- vi. AFP – Helps detect testicular cancer, stomach, liver, pancreatic renal, brain, lymphatic cancers
- vii. Urinalysis – Tests for blood in the urine which can indicate infection or bladder, urologic or kidney cancers
- viii. High-sensitivity CRP (hs-CRP) tests help determine the risk of heart disease before symptoms are present. Higher hs-CRP levels are associated with a higher risk of heart attack, stroke, and cardiovascular disease.

Hematologic labs will be obtained by our certified phlebotomists. Blood draws are completely optional, and participants will choose which labs will be drawn. They will undergo standard blood draw using universal precautions for infection prevention. Specimens will be labeled by the phlebotomist and stored in a regulated medical container. Needles will be disposed of in OSHA approved sharps disposal container. Spill containment kits will be present at the screening site. At the conclusion of the screening day all materials will be removed from the site, samples will be taken to the nearest processing lab. Results will be communicated to the patient along with ultrasound findings.

## **Tab 4**

### **Service Approach and Methodology**

#### **Reporting Results**

4. All patients will receive a copy of their lab results within one week. HRU will contact screened participants with abnormal results. Within one week after their exam, our licensed medical doctor, physician assistant or nurse practitioner will contact each patient with significant findings. This consultation will include what the exact findings are and what should be done with this information. Potential specialists that should be contacted will be determined by primary care, HRU will providing screening results to the primary care team. If the participant does not have a primary care physician, the consulting provider will make recommendations for a primary care team in Henrico County.

Reports will be available to participants online, in our secure Picture Archiving and Communication System (PACS). Each participant will receive a secure login via email which allows them to view their results. At the participants request, results within normal limits, can also be discussed over the phone. These results require a phone call to Hampton Roads Ultrasound to request a return call from a provider to discuss results. All reports will also be available for printing one week after screening. Secure access will be available for one year after screening.

5. Hampton Roads Ultrasound will provide aggregate results comparing its findings to current industry data provided by the National Institute for Occupational Safety and Health. Once all participants have been screened, HRU will use this data to design a comparative analysis to display abnormal findings. Our findings will include the number of masses found in the kidneys, uterus, ovaries, gall bladder, thyroid, scrotum, and liver. In addition, we will also document the number of fire fighters with enlarged hearts, valvular abnormalities, aneurysm in the aorta and blockage in the carotid arteries.

6. HRU is willing and able to provide a team of medical professionals to evaluate organs for the presence of tumors, cysts, and cardiovascular disease. Our cardiovascular screenings will assess for blockage of arteries and abnormal dilation of vessels. We will provide the most accurate ultrasound assessments and specialists interpreted reports for the use of diagnosing and treating disease.



## **Tab 4**

### **Service Approach and Methodology**

7. HRU will provide onsite services for the purpose of cardiovascular and cancer screenings for the Henrico County Division of Fire. Our team will provide all the equipment required to fulfill this agreement. We specialize in providing ultrasound services and are confident we can fulfill the requirements of this agreement. Hampton Roads Ultrasound professionals are equipped to handle setup and breakdown for screenings. We currently provide ultrasound screenings in churches, hospitals, business offices and health fairs. Our unique advantage is we have invested in ultrasound technology that allows us to perform screenings in multiple locations. We can commit with promise to provide a service that is accurate, comfortable, accessible, and convenient.

8. HRU shall coordinate with the DOF Safety and Wellness Coordinator to ensure that all requirements of the agreement are met in a timely manner. This includes the daily scheduling for screenings and follow-ups. HRU will ensure communication with the Safety and Wellness contact for scheduling and the location of screenings. We will communicate and ensure proper equipment setup and personnel. Scheduling will include 75-minute appointments for each participant, several days per week, during normal business hours.

Hampton Roads Ultrasound is an independent diagnostic testing company. We have over 15 years' experience in providing ultrasound exams and screenings. Our services have included participants with cardiovascular and cancer risk factors, as well as exposure to occupational hazards. HRU will provide, physicians, sonographers and healthcare professionals that are licensed and certified. All personnel are insured through Hampton Roads Ultrasound's policy, provided by The Doctors' Insurance Agency. We also provide ultrasound and echocardiography machines that are diagnostic, accurate and designed for mobile use. Our exam beds are portable, allowing for set-up and break down daily. HRU physicians are licensed to practice in the state of Virginia. Reading physicians are licensed medical practitioners with a thorough understanding of ultrasound sonography. Dennis Walker, DO, a Radiologist, is certified by the American Board of Radiology, Joseph Freedman, MD, Keith Newby, MD and Mark East, MD are practicing Cardiologists licensed in the state of Virginia. They have been our partners in healthcare for over 15 years. They are familiar with the principles of ultrasound technology and meet the certifications required by American Board of Cardiovascular Medicine.

HRU is compliant with HIPAA and all state and federal privacy laws and OSHA standards for record retention. Cloud technology and laptops are password protected. HRU also complies with federal regulation to notify patients immediately of loss of hardware that may contain private patient information. We also notify individuals of any data breach. Each piece of equipment is signed out by sonographers and is equipped with remote tracking software. While at the screening, each employee is to monitor the equipment. Sonographers are required to return each device at the conclusion of the screening and check the devices into our home office. HRU makes every effort to maintain security of portable devices.

## **Tab 4**

### **Service Approach and Methodology**

9. Screenings will be performed in a manner that will maximize firefighters' capability to be available in cases of emergency. This provides little disruption to their workday. HRU will coordinate with the Henrico County DOF and create a schedule 30 days prior to the start date of screenings.

10. Hampton Roads Ultrasound observes major holidays and understands that Henrico County Division of Fire does not require screening services during those days. Screenings will occur on Monday through Friday, between the hours of 8:00am and 5:00 pm, except for recognized holidays.

## **Tab 5 Exceptions**

1. Ultrasound is an excellent diagnostic tool with exceptional capabilities in experienced hands, however, it has limitations. The effectiveness of ultrasound depends on the ability of sound waves to penetrate tissue. Air (gas) and body habitus (density of fatty tissue) may limit some measurements and the ability to see organs in detail. HRU will make every effort to provide the measurements required for a proper diagnosis. The lack of fasting, a full bladder, greasy food and colored drinks (i.e., coffee, soda and juices) can limit the exams effectiveness.
2. Participants may decline any ultrasound screening. Some screenings require disrobing at the discretion of the participant. HRU will make every effort to ensure the participants are informed and comfortable before performing the examination.
3. HIPAA regulations prevent us from sharing patient information without consent. This limits the amount of data given to not only the primary care team but also the County. HRU will strongly encourage participants to share their screening results with their PCP.
4. Screenings can lead to false positive results. A follow up may be required to confirm the absence or presence of disease.
5. Transthoracic Echocardiogram may have limitations on its use for adult patients. For patients with chronic obstructive pulmonary disease, the interposition of air-filled lung between the body surface and the heart severely limits access, and complete examination may not be possible.
6. Abnormal findings will require biopsy or advanced imaging in order to definitively validate the status of a mass.

## **Tab 6**

### **Assumptions**

1. It is assumed that the County of Henrico will provide adequate space for the performance of all screenings on the agreed upon dates.
2. Henrico County DOF will agree on designated days for screenings. The County will encourage the participants to attend their scheduled appointment, with the exception of the presence of emergencies.
3. Ultrasound and Lab testing is not 100% there may be false positives or negatives reported. Serial follow-up is important after a diagnosis.
4. These screenings are not mandatory, and each participant will have the opportunity to choose which examinations they would like to undergo.
5. Participants will choose the screenings they would like to undergo from a list of tests.
6. The project will end after all firefighters have had been screened.
7. Henrico County Division of Fire will use ACH payment for satisfying invoices.

## Appendix H: Works Cited

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November 9, 2022

Hampton Roads Ultrasounds, LLC  
1545 Crossways Blvd., Suite 250  
Chesapeake VA 23320

INSURED: Hampton Roads Ultrasound, LLC  
POLICY NUMBER: CO000003361-06  
POLICY PERIOD: 6/12/2022 - 6/12/2023  
CARRIER: Admiral Insurance Company

Who may concern,

This confirms that we have received your request to increase limits of liability to \$2MM/\$4MM for Professional Liability Insurance. Coverage will be issued as requested effective 12/15/2022.

Should you have any questions, feel free to contact our office. Thank you for your business.

Sincerely,



O'Brien Insurance Services, Inc.  
The Doctors' Insurance Agency

**CERTIFICATE OF LIABILITY INSURANCE**

DATE (MM/DD/YYYY)

6/25/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must have **ADDITIONAL INSURED** provisions or be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b>  The Doctors' Insurance Agency 454 Las Gallinas Ave. Suite 179 San Rafael, CA 94903	<b>CONTACT NAME:</b> Brad O'Brien	
	<b>PHONE (A/C, No. Ext):</b> (800) 553-9293	<b>FAX (A/C, No):</b> (415) 506-3031
	<b>E-MAIL ADDRESS:</b>	
	<b>INSURER(S) AFFORDING COVERAGE</b>	
<b>INSURED</b>  Hampton Roads Ultrasound, LLC  1545 Crossways Blvd, Suite 205 Chesapeake, VA 23320	<b>INSURER A:</b> Admiral Insurance Company	
	<b>INSURER B:</b>	
	<b>INSURER C:</b>	
	<b>INSURER D:</b>	
	<b>INSURER E:</b>	
	<b>INSURER F:</b>	

**COVERAGES****CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
<input checked="" type="checkbox"/>	<b>COMMERCIAL GENERAL LIABILITY</b>  <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			CO000003361-06	6/12/2022	6/12/2023	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 3,000,000 PRODUCTS - COMP/OP AGG \$ 1,000,000
<input type="checkbox"/>	<b>AUTOMOBILE LIABILITY</b>  <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
<input type="checkbox"/>	<b>UMBRELLA LIAB</b> <input type="checkbox"/> OCCUR <b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$
<input type="checkbox"/>	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N <input type="checkbox"/> N/A						PER STATUTE <input type="checkbox"/> OTH-ER <input type="checkbox"/> E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
<b>A</b>	<b>Medical Professional Liability</b>			CO000003361-06	6/12/2022	6/12/2023	<b>Each Claim</b> \$1,000,000 <b>Aggregate</b> \$3,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Evidence of Medical Professional Liability - Claims Made and General Liability - Occurrence  
Retro active Date: 6/12/2017

Coverage for contracted Medical Director Dennis Walker, DO

**CERTIFICATE HOLDER****CANCELLATION**

Certificate Holder

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Brad O'Brien



# Hampton Roads Ultrasound Screening Consent Form

---

## Name

First Name

Last Name

## Address

Street Address

Street Address Line 2

City

State / Province

Postal / Zip Code

## Phone Number

Area Code

-

Phone Number

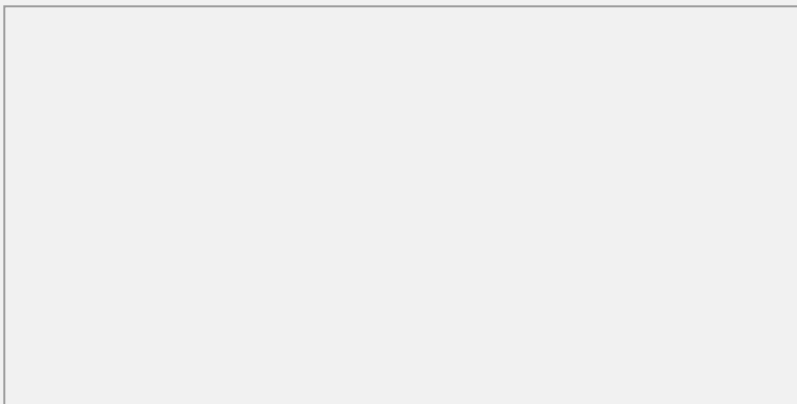
## Email



example@example.com

I hereby release the screening physician, Hampton Roads Ultrasound and all other healthcare volunteers from all responsibility in connection with this screening exam. I understand that I will only be screened for risk factors or symptoms of cardiovascular disease and cancer and that this screening does not constitute a complete medical exam or diagnosis, and that I do not have a physician-patient relationship with the screening physician by virtue of this screening exam. I further understand that I will receive a copy of my screening results as well as a follow-up phone call from a licensed medical provider and that it is solely my responsibility to seek any appropriate follow-up medical treatment as indicated by my screening results. No one may use my examination results for any purpose, except that the information from my results may be used in a statistical study as long as my name is not published. I consent to ultrasound testing performed by Hampton Roads Ultrasound. I have read and understand this form and understand the information presented.

### Signature



[Clear](#)

**Would you like a copy of this information to be sent to your primary care physician?**

- ☐ Please send a copy of my results to my primary care physician.
- ☐ Please DO NOT send a copy of my results to my primary care physician.

### Primary Care Physician

First Name

Last Name

### Primary Care Physician Phone Number

Area Code

-

Phone Number

### Primary Care Physician Address

Street Address

Street Address Line 2

City

State / Province

Postal / Zip Code

## Hampton Roads Ultrasound Health History

---

### Allergies

### Surgical history

Type here...

### Risk Factors

- ☐ Tobacco Use
- ☐ High Blood Pressure
- ☐ Previous stroke/TIA
- ☐ Diabetes
- ☐ Obesity
- ☐ Family history of stroke
- ☐ High cholesterol
- ☐ Heart Disease
- ☐ Family history of abdominal aorta aneurysm
- ☐ Vascular surgery
- ☐ Excessive alcohol use
- ☐ Family history of cancer
- ☐ Previous diagnosis of any type of cancer
- ☐

### Current symptoms

- ☐ Leg cramps with walking/pain with walking
- ☐ Tenderness in abdomen
- ☐ Difficulty speaking
- ☐ Back pain
- ☐ Dizziness
- ☐ Headaches
- ☐ Numbness or weakness on one side of body
- ☐ Loss of balance or coordination

- ☐ Sudden loss of vision
- ☐ Scrotal pain
- ☐ Scrotal swelling
- ☐ Abnormal scrotal mass
- ☐ Pelvic pain
- ☐ Abnormal vaginal bleeding
- ☐ Adnexal (right or left pelvic pain)
- ☐ Abnormal hot or cold sensitivity
- ☐ Chest pain
- ☐ Palpitations
- ☐ Shortness of breath at rest
- ☐ Abnormal shortness of breath on exertion
- ☐ Easy bruising
- ☐ Swollen lymph nodes
- ☐ Hallucinations
- ☐ Confusion
- ☐ Nose bleeds
- ☐ Mouth sores
- ☐ Diarrhea

Please select the ultrasound screening tests you would like to receive.

**Select the examinations you want to have**

- ☐ Carotid Screening (Assesses for blockage that can cause stroke)
- ☐ Echocardiogram (Assesses for heart enlargement and valve disorders)
- ☐ Abdominal Aorta (Assesses for possible abdominal aorta aneurysm)
- ☐ Thyroid Ultrasound (Assesses for thyroid masses)
- ☐ Abdominal Ultrasound (Assesses the liver, kidneys, spleen gall bladder for masses)

- ☐ Bladder Ultrasound (Assesses the bladder for masses and stones)
- ☐ Testicular (Assesses the testicles for masses, requires disrobing and exposing the scrotum)
- ☐ Pelvic Ultrasound (Assesses for uterine and ovarian masses and endometrial abnormalities. Transabdominal/External exam; DOES NOT require disrobing, external exam of the uterus and ovaries)
- ☐ Pelvic Ultrasound (Assesses for uterine and ovarian masses and endometrial abnormalities. Transvaginal/Internal exam; DOES require disrobing, internal exam of the uterus and ovaries)
- ☐ Ankle Brachial Index (Assesses for peripheral vascular disease)

I certify that all the information provided is accurate to the best of my ability and I consent to the cardiovascular and cancer screening examination.

**Signature**

[Clear](#)

Submit



## Virginia Department of Health Professions License Lookup

Current as of 11/03/2022 23:20

### License Information

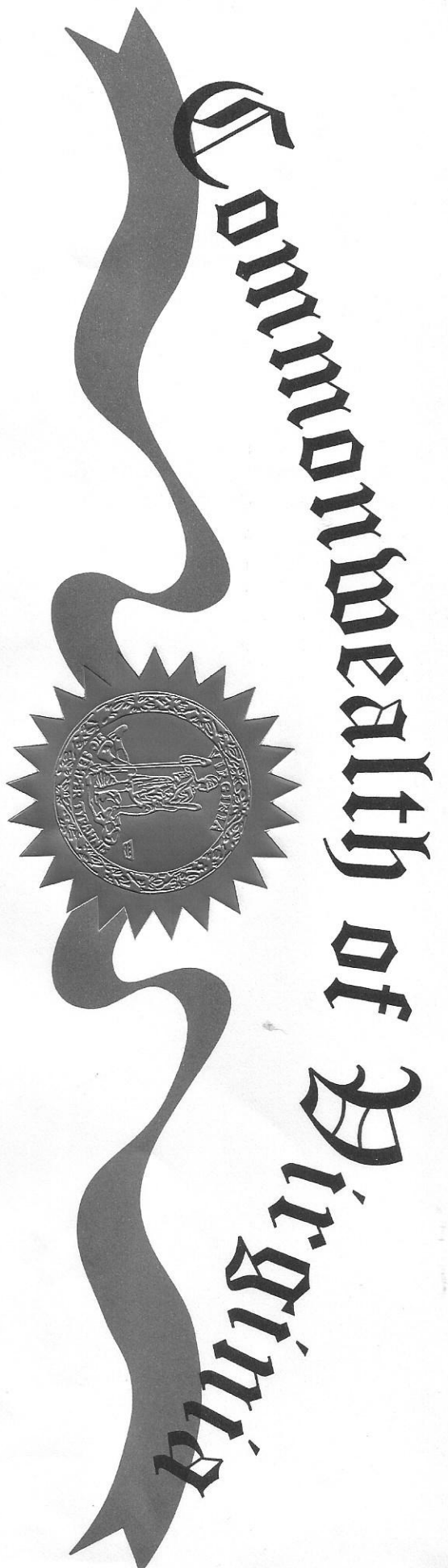
<b>License Number</b>	0110004964
<b>Occupation</b>	Physician Assistant
<b>Name</b>	Alphonzo J Smalls
<b>Address</b>	Chesapeake, VA 23320
<b>Initial License Date</b>	06/12/2015
<b>Expire Date</b>	12/31/2023
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

[Back to License Lookup Result](#)

**This serves as primary source verification of the credential issued by the Commonwealth of Virginia and meets the requirements of the Joint Commission.**

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## PUPIL PERSONNEL SERVICES LICENSE

*Effective July 1, 2013, to June 30, 2018*

**AYISHA MONIQUE BUGGS**

(MASTER'S DEGREE)

This individual is authorized to teach or hold positions in Virginia schools indicated below:

SCHOOL COUNSELOR PREK-12

(Educational technology standards have been met.)

(Child abuse recognition and intervention requirement has been met.)

David M. Foster  
President, Board of Education

A handwritten signature in dark ink, appearing to read "David M. Foster", is written over a horizontal line.

License Number: PPS-0602112  
June 19, 2013

Patricia I. Wright, Ed.D.  
Superintendent of Public Instruction

A handwritten signature in dark ink, appearing to read "Patricia I. Wright", is written over a horizontal line.



## Virginia Department of Health Professions License Lookup

Current as of 11/06/2022 11:43

### License Information

<b>License Number</b>	0101234427
<b>Occupation</b>	Medicine
<b>Name</b>	Mark A East
<b>Address</b>	Norfolk, VA 23502
<b>Initial License Date</b>	02/28/2003
<b>Expire Date</b>	11/30/2022
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

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[Back to License Lookup](#)





## Virginia Department of Health Professions License Lookup

Current as of 11/03/2022 23:27

### License Information

<b>License Number</b>	0101276186
<b>Occupation</b>	Medicine
<b>Name</b>	Joseph Freedman
<b>Address</b>	Fort Myers, FL 33908
<b>Initial License Date</b>	07/25/2022
<b>Expire Date</b>	06/30/2024
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

[Back to License Lookup Result](#)

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**1401 Rockville Pike  
Suite 600  
Rockville, MD 20852  
1-800-541-9754 | [ARDMS.org](https://www.ardms.org)**

Print

The information displayed below constitutes the current status with ARDMS as of 11/03/2022, 12:00 PM US eastern time (4:00 PM UTC/GMT).

1 match found.

---

HENCIAK, RANDALL  
USA, NC  
RDMS,AB (2010),BR (2010),OB/GYN (2009)  
RVT,VT (2011)  
Valid Until: 12/31/2023



## Virginia Department of Health Professions License Lookup

Current as of 11/03/2022 23:25

### License Information

<b>License Number</b>	0024185222
<b>Occupation</b>	Licensed Nurse Practitioner
<b>Specialization</b>	Family RX Authority
<b>Name</b>	Chiqilla S McCoy
<b>Address</b>	Norfolk, VA 23513
<b>Initial License Date</b>	09/13/2022
<b>Expire Date</b>	10/31/2023
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

[Back to License Lookup Result](#)

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## Virginia Department of Health Professions License Lookup

Current as of 11/06/2022 11:44

### License Information

<b>License Number</b>	0101051954
<b>Occupation</b>	Medicine
<b>Name</b>	Keith H Newby
<b>Address</b>	Norfolk, VA 23510
<b>Initial License Date</b>	12/30/1994
<b>Expire Date</b>	06/30/2024
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

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Print

The information displayed below constitutes the current status with ARDMS as of 11/03/2022, 12:00 PM US eastern time (4:00 PM UTC/GMT).

1 match found.

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**SMALLS, ALPHONZO**  
USA, VA  
RVT,VT (2003)  
Valid Until: 12/31/2022



## Virginia Department of Health Professions License Lookup

Current as of 11/03/2022 23:22

### License Information

<b>License Number</b>	0102201806
<b>Occupation</b>	Osteopathic Medicine
<b>Name</b>	Dennis D Walker
<b>Address</b>	Williamsburg, VA 23188
<b>Initial License Date</b>	10/13/2005
<b>Expire Date</b>	08/31/2024
<b>License Status</b>	Current Active
<b>Additional Public Information*</b>	No

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# Alphonzo Smalls, PA-C

2736 Gum Road Chesapeake, VA 23321  
(757)749-2308 • [ajsmalls1210@gmail.com](mailto:ajsmalls1210@gmail.com)

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## Clinical Strengths:

- Patient Assessment
- Perform various diagnostic ultrasound exams
- Wound closure
- Developing Treatment Plans
- Analyze and interpret diagnostic tests
- Sterile technique
- Medication Management
- Splinting and wound care
- Foley catheter insertion
- Physical exam
- Assist in venous surgical procedures
- Chest tube management
- Formulating analytical and technical reports
- Proficient knowledge of anatomy, physiology, hemodynamics and pathology
- Initiate peripheral IVs and arterial lines

## Core Competencies:

- Excellent clinical decision making skills
- Excellent time management
- Strong ability for critical and logical thinking
- Pleasant demeanor
- Outstanding patient interaction
- Effective verbal and written communication
- Ability to function as a team member with limited supervision
- Proficient in the use of Epic

## Certifications:

Physician Assistant Certified – VA state license number - 0110-004964

Registered Diagnostic Medical Sonographer – Vascular Sonography – registry number – 101858

## Memberships:

American Academy of Physician Assistants  
Society of Vascular Ultrasound

## Professional Accomplishments:

Led organization that was awarded Joint Commission Accreditation for Ambulatory Care Center - 2006-2012

Led organizations that were awarded Intersocietal Accreditation for Vascular Labs – 2005-2012

Created programs that gained Category I CME recognition from the Society of Diagnostic Medical Sonography for Ultrasound Education – 2011-2013

## Education:

Eastern Virginia Medical School  
Norfolk, VA

Master of Science Physician Assistant Studies - Graduation May 2015

Sentara Norfolk General Hospital's School of Health Professionals  
Norfolk, VA

Degree in Non-Invasive Cardiovascular Technology – 2001-2003

Old Dominion University  
Norfolk, VA

Bachelor of Science in Biology – 1995-2000

## Professional Experience:

### **Tidewater Medical Care**

#### Internal Medicine Physician Assistant

- Experience in management of chronic medical illnesses such as, diabetes mellitus, chronic bronchitis, hypertension, hyperlipidemia, heart failure, chronic obstructive pulmonary disease and chronic kidney disease
- Gained experience in management of acute exacerbation of heart failure and COPD, and acute kidney injury as well as a wide spectrum of acute illnesses in the hospital setting including pneumonia, urinary tract infections, sepsis and electrolyte abnormalities
- Responsible for independently establishing daily case load of 16-20 patients
- Responsible for creating detailed progress notes and comprehensive discharge notes
- Responsible for ordering, reviewing, and interpreting laboratory data and imaging studies
- Participate in medical decision making and institute treatment plans

### **Hampton Roads Ultrasound**

#### Chief Operations Officer

#### Lead Ultrasound Sonographer 2012 – present

- First assist in venous ablation exams (VNUS procedures)
- Perform pre-procedural venous mapping duplex exam for venous ablation
- Responsible for training of technologists and ensuring quality control for sonographic examinations
- Created and implemented strategy to maximize productivity
- Successfully apply PACS and electronic health record technology programming for image management
- Able to confidently and accurately perform full range of vascular ultrasound exams and liver and kidney ultrasound

### **Unique Imaging Solutions**

#### Co-Owner/Technical Director 2004-2012

- Consistently qualified and received hospital laboratory accreditations (ICAVL) for two area hospitals
- Supervised policy and procedure implementation for organization
- Researched and implemented new electronic health record technology across organization
- Laboratory director for two area hospitals
- Trained newly hired staff and maintained training manuals for quality assurance
- Confidently and accurately perform full range of vascular ultrasound exams
- First assist in venous ablation surgical procedures (VNUS procedures)

### **Sentara Norfolk General Hospital**

#### Vascular Ultrasound Technologist 2002-2004

- Responsibilities included proper interview and acquisition of clinical data pertinent to prescribed test(s)
- Performed extracranial cerebral vascular, lower extremity arterial and lower and upper extremity venous as well as renal artery duplex examinations, aorta-iliac duplex examinations and groin duplexes with proficiency
- Documented preliminary findings and reported results to physicians involved in patient care

## Professional References:

Available upon request



# Ayanna Smalls

**LinkedIn:** <HTTPS://WWW.LINKEDIN.COM/IN/AYANNA-J-SMALLS-7584B7166>

**Email:** [Smalls\\_Ayanna@bah.com](mailto:Smalls_Ayanna@bah.com)

**Residence:** Norfolk, Virginia

**Cell:** (757)774-2270

**Clearance:** Top secret/ TS/SCI

**Willing to Travel:** 50%

## Education

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- BS, Computer Engineering • 2021 • Old Dominion University
- AS, Computer Science • 2020 • Tidewater Community College

## Technical Skills

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- |                      |          |
|----------------------|----------|
| • Linux Ubuntu       | • MATLAB |
| • Windows PowerShell | • Pspice |
| • AWS                | • Unreal |
| • Azure              | • Unity  |
| • Terraform          | • C      |
| • Docker             | • C++    |
| • Kubernetes         | • C#     |
| • Gremlin            | • Java   |
| • GitHub             | • Python |

## Competencies

---

- Systems Design, Analysis, Testing, Evaluation, and Integration
- Project Management
- Agile Development
- Data Analysis with excel macros and Tableau
- Amazon Web Services (AWS)
- Cloud Development Operations
- Systems Administration
- Hardware and software troubleshooting

## Certifications

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Agile Programming and development – EDX certification 2020  
Python programming for physics – ODU Reyes certification 2020  
Accenture Discovery Program – Accenture certification 2020  
Amazon Web Services Cloud Practitioner - Amazon 2022 (IP)  
Amazon Web Services Solutions Architect- Amazon 2022 (IP)

## Experience

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### DEVOPS ENGINEER \*BOOZ ALLEN HAMILTON\* 2021-PRESENT

- Work on the Internal Platform team for Booz Allen Hamilton.
- Help with various Jira tasks that work towards the goal of updating and further developing cloud projects.
- Develop and sharpen my skills for cloud agnostic tools.

### CLOUD ENGINEER \* BOOZ ALLEN HAMILTON SUMMER GAMES \*2021 – 2021

- Worked with team to create a tool that helps intelligence community branches convert from single cloud to multi-cloud, in order to increase data security and efficiency, as well as automate system failovers
- Helped define the team's focus by researching how multi-cloud platforms can be incorporated into the intelligence community and how switching from single-cloud to multi-cloud is beneficial.
- Presented technical research for development, planned team tag-ups, assigned project deadlines, and drew on existing IC contacts to gather the resources to define client needs
- Gained a working knowledge of development tools (Amazon Web Services (AWS), Azure, Kubernetes, terraform, chaos engineering, and Linux Ubuntu) and cloud architecture by conducting intensive research and designing on commercial cloud platforms
- Served as a liaison for the three agencies (Booz Allen Hamilton, DIA, and NGA)

### SOFTWARE ENGINEER \* ID Tech 2020-2021

- Develop running gaming software, using a variety of programming languages and software platforms
- Assisted in hardware troubleshooting, software testing, debugging, and design
- Designed visual concept and user interface (UI) engineering using agile programming methods, research, and development

### SOFTWARE DEVELOPER CONSULTANT \*Accenture Virtual Discovery Program internship 2020

- Developed project priorities and planning for virtual client needs
- Used outcomes analysis to review multiple sources, interpret, extract, and combine data to find answers to client questions. Served as a liaison for client communication
- Streamlined prioritization, impact techniques, and assessment to ensure agile project development for redesigning and user experience (UX) designing for web pages

SOFTWARE ENGINEER • ENGINEERING FOR KIDS • 2016 – 2019

- Taught STEM concepts for programming languages and tools. (ex: Lego EV3, Unity 3D, Minecraft, VEX, NXT, and Scratch)
- Created 2D&3D synthetic models for project-based learning
- Developed and incorporated technology-based lesson plans which enhanced mathematical and computer science concepts as well as design, building, and programming of VEX IQ robots

## **AYISHA M. BUGGS**

2736 Gum Road  
Chesapeake, VA 23321

Home: (757) 673-6302

Mobile: (757) 575-5460

[ayishambuggs@hotmail.com](mailto:ayishambuggs@hotmail.com)

### **PROFESSIONAL OBJECTIVE**

To utilize and challenge my professional skills and experience , while offering continued positive growth and development within an organization.

### **QUALIFICATIONS SUMMARY**

Dedicated professional with proven business management skills and excellent interpersonal communication abilities. A results-oriented and creative leader who strives to meet and exceed business goals and objectives. Known for applying first-rate teaching skills to both classroom and business environments. A team player with a commitment to excellence and success.

Skills and knowledge include:

#### **EDUCATIONAL SKILLS**

- Teaching/Educational Development
- Coaching/Counseling/Youth Services
- Lesson Plans/Curriculum Design
- Academic Progress Reports/Analyses
- Parent/Teacher Conferences

#### **BUSINESS SKILLS**

- Cost Benefits/Risk Management
- Accounts Payable/Receivable
- Contract Negotiation/Closings
- Office Management/Supervision
- Employee Training/Development

A result, oriented professional who possesses exceptional work ethics and educational skills. Consistently strives to meet and exceed district goals and objectives. Easily establishes good rapport with a diverse range of individuals and ability to learn new tasks quickly and successfully.

### **EDUCATION**

#### **Norfolk State University – Norfolk, VA**

Master's of professional School Psychology/ Urban Studies

GPA: 3.8

#### **Norfolk State University – Norfolk, VA**

Bachelor of Science/Clinical Psychology

Minor in Urban Affairs

GPA: 3.6

**HIGHLIGHTS OF PROFESSIONAL EXPERIENCE****Relevant Work History****Hampton Roads Ultrasound (HRU)- Chesapeake, VA****Chief Operation Officer.....07/11-Present**

- Build and maintain strategic networks of internal stakeholders for cross-functional policy issue alignment.
- Provide subject matter expertise and support for key business and corporate partners.
- Oversee marketing management and strategic communications for promoting organization's reputation.
- Initiate the development and execution of integrated public affairs strategies
- Negotiate and approve contracts with vendors and suppliers for federal and state agencies.
- Provide financial planning and analysis support for all organization's financial reporting, performance budget, forecast variance analysis, and annual budget cycle.

**City Council Member.....2020-Present**

- Attend events, community board, council meetings, and local city events
- Discuss and vote on implementing events for the advancement of missions, interest, and goals of Chesapeake Behavior Integrated Services
- Along with City Council Members, identify appropriate events to strengthen community relationships and conduct meaningful and intentional outreach activities,

**Unique Imaging Solutions – Hampton, VA****Vice President OF Operations.....07/04 – 08/11**

- Increase company productivity through marketing strategies
- Conducts risk management and cost benefit analyses for potential clients
- Negotiates contracts with clients and renew agreements
- Supervises and manages the office staff
- Maintain oversight for A/R, A/P, and inventory and accountability processes
- Maintain high quality standards and customer satisfaction

**Towers Perrin – Chesapeake, VA****Benefits Consultant.....06/00 - 10/04**

- Consultant for financial and health insurance analysis for Boeing Corporation
- Provided estimates and financial calculations on benefit plans and related items
- Conducted in-depth training sessions for new employees and subordinate personnel
- Maintain and strengthen relationships with top leadership for retiree account
- Worked with company executives and high-level management in the delivery of client engagements
- Work with the executive team to identify, design and develop comprehensive benefit strategies for new benefit initiatives
- Advise clients on insurance, employee benefits, and compliance issues
- Present viable solutions that are both creative and cost-effective for the company and client
- Contribute to operational readiness, organizational change management, and organization solution.

**Community Solutions – Norfolk, VA****Community Outreach Specialist.....06/99 – 06/00**

- Project Coordinator responsible for ensuring outreach programs are well organized and Community partners receive high-quality service
- Provide executive and administrative support to the Chief Operating Officer and the Operations Team
- Work cooperatively with business owners, police, and citizens to serve communities for the benefits harm/risk reduction.
- Created academic curriculum consistent with SOL competencies for each grade level

**Other Work History****Huntington Learning Center – Chesapeake, VA****Teacher.....01/12-12/12**

- Remediate participants in grades K-12 in a private setting
- Evaluate and perform assessments for students with learning disabilities
- Asses students' progress and provide correspondence analysis

**Olive Branch Elementary –Portsmouth, VA****Professional Guidance/School Counselor.....08/04-06/11**

- Create Behavior Intervention Plan
- Collaborate with the School Psychologist and School Social worker to identify at risk students.
- Facilitate daily classroom guidance lessons for character development
- Conduct individual academic counseling for at-risk students
- Create and facilitate behavior modification strategies for students
- Administered crisis counseling for students in need
- Provide career counseling for school populations
- Implement and developed team building exercises for faculty and staff
- Serve as Testing Coordinator for Benchmarks and SOL assessments
- Access student profiles for academic advising and scheduling.
- Assist administrators and teachers in identifying students with special abilities.
- Serve as 504 Coordinator for identified students
- Create annual student social programs
- Develop academic tutoring programs for students
- Oversee school and community outreach programs
- Write and acquire community grants to fund
- Maintain budget for school guidance programs
- Behavior Team School Improvement committee chair

**Wilson High School–Portsmouth, VA**

**Professional Guidance/School Counselor.....08/04-06/04**

- Conduct individual counseling for students in 9-12 grades
- Conduct small groups counseling for students in 9-12 grades
- Career Development counseling
- Life Skills counseling
- Liaison and resource for parent and community programs
- Monitor academic requirements to insure graduations are fulfilled
- Assistant school's Testing Coordinator
- Proctor the Standard of Learning (SOL) test
- Assist with student scheduling.
- Collaborate with school administrator, teachers, faculty and other special services personnel
- Assist administrators and teachers in identifying students with special abilities.

**Churchland Middle School–Portsmouth, VA**

**Professional School Counselor.....08/03-04/04**

- Conduct individual counseling for students in 9-12 grades
- Conduct small groups counseling for students in 9-12 grades
- Career Development counseling
- Life Skills counseling
- Liaison and resource for parent and community programs
- Monitor academic requirements to insure graduations are fulfilled
- Assistant school's Testing Coordinator
- Proctor the Standard of Learning (SOL) test
- Assist with student scheduling.
- Collaborate with school administrator, teachers, faculty and other special services personnel
- Assist administrators and teachers in identifying students with special abilities.

**Children Harbor Day School – Suffolk, VA**

**Teacher.....12/01– 07/02**

- Created and designed flexible and adaptable educational programs for 4 and 5 year olds
- Meticulously adhered to all state and district policies and regulations
- Encouraged and assisted student in their development, attitudes, and difficulties
- Provided students with an outstanding foundation for a positive future
- Established positive relationships with students, parents, and coworkers

**Ayisha M. Buggs**

**Page 5**

**VA Beach Psychiatric Hospital – Virginia Beach, VA**

**Mental Health Counselor.....10/02 – 12/04**

- Assessed and interfaced with patients in accordance with therapeutic treatment plans
- Conducted educational groups for patients and families on daily coping skills
- Performed therapeutic individualized counseling sessions with patients

**Discovery Care Daycare Center – Norfolk, VA**

**Teacher.....05/97 – 05/99**

- Promoted intellectual, social, and emotional growth of 3 and 4 year old children
- Developed numerous programs to help develop and enhance verbal skills for children
- Coordinated parent/teacher conferences to discuss academic and behavioral progress

**ADDITIONAL INFORMATION AVAILABLE AT YOUR REQUEST**



# CHIQILLA MCCOY

 mooreelliott@yahoo.com

 7573907786

 NORFOLK, VA 23513

## PROFESSIONAL SUMMARY

Enthusiastic Family Nurse Practitioner eager to contribute to team success through hard work, attention to detail and excellent organizational skills. Looking to seek and maintain full-time position that offers professional challenges utilizing interpersonal skills, excellent time management and problem-solving skills.

## SKILLS

- Compassionate and Caring
- Medication Side Effect Knowledge
- Accurate Documentation
- Patient Condition Monitoring
- Patient Examination
- Interpreting EKGs

## EDUCATION

### South University

Virginia Beach, VA • 01/2020

#### *Masters Of Science In*

*Nursing*: Family Nurse Practitioner

### South University

Virginia Beach, VA • 06/2019

#### *Bachelors Of Science In*

*Nursing*: Registered Nurse

## WORK HISTORY

### **Aya Healthcare - Registered Nurse, Medical-Surgical Unit** *Newport News, VA • 02/2022 - Current*

- Provided didactic and clinical instructions to orient new nurses and potential student nurses to achieve training outcomes.
- Evaluated healthcare needs, goals for treatment and available resources of each patient and connected to optimal providers and care.
- Advocated for patients by communicating care preferences to practitioners, verifying interventions and met treatment goals.
- Administering medications and monitoring drips.

### **Portsmouth City Jail - Family Nurse Practitioner Student** *Portsmouth, VA • 10/2021 - 12/2021*

- Ordered and interpreted diagnostic tests to develop and implement treatment plans.
- Performed patient physicals and compared and contrasted results with established medical records to provide proper diagnosis and facilitate appropriate treatment.
- Examined wounds and treated lacerations with bandaging, suturing and topical medications.
- Worked in women's health services providing counseling on reproductive issues and assisting with family planning needs.
- Teamed with physicians to provide comprehensive

patient care, referrals and high-risk management strategies.

- Educated patients on treatment options, medical needs and non-medical options for treatments and therapy.

**Pediatric Specialists In Richmond - Family Nurse Practitioner Student**

*Richmond, VA • 08/2021 - 10/2021*

- Ordered and interpreted diagnostic tests to develop and implement treatment plans.
- Performed patient physicals and compared and contrasted results with established medical records to provide proper diagnosis and facilitate appropriate treatment.
- Examined wounds and treated lacerations with bandaging, suturing and topical medications.
- Prescribed appropriate pharmacologic and non-pharmacologic treatment modalities to support health and comfort of patients.
- Educated patients on treatment options, medical needs and non-medical options for treatments and therapy.
- Discussed care plans with patients and explained test results and proper use of medications.

**Sentara Norfolk General Hospital - Registered**

*NORFOLK, VA • 07/2019 - 06/2021*

- Administered medications and treatment to patients and monitored responses while working with healthcare teams to adjust care plans.
- Accurately documented treatment, medications and IVs administered, discharge instructions and follow-up care.
- Educated family members and caregivers on patient care instructions.
- Communicated with healthcare team members to plan, implement and enhance treatment strategies.
- Administered different therapies and medications in line with physician orders and treatment plan.
- Explained course of care and medication side effects to patients and caregivers in easy-to-understand terms.
- Managed patients recovering from medical or surgical procedures.
- Monitored patient reactions after administering medications and IV therapies.

- Provided skilled, timely and level-headed emergency response to critically-ill patients.
- Followed all personal and health data procedures to effectively comply with HIPAA laws and prevent information breaches.

### **Lake Taylor Transitional Care Hospital - LPN**

*Norfolk, VA • 01/2010 - 11/2019*

- Documented accurate and complete patient information to address patient problems and expected outcomes.
- Administered controlled narcotics, inserted IVs and performed catheterizations.
- Assisted with admissions, appointments, transfers and discharges.
- Managed patient care through closely monitoring respiration, blood pressure and blood glucose levels.
- Monitored, tracked and conveyed important patient information to healthcare staff to help optimize treatment planning and care delivery.
- Used aseptic techniques to provide sterilized wound care and dressing applications.
- Cared for wounds, provided treatments and assisted with procedures.
- Monitored and tracked patient vitals in [Software](#) to keep team informed of changing conditions.

## Curriculum Vitae

### PERSONAL DATA

Full Name: Dennis Dean Walker, DO  
**Board Certified Radiologist/ABR**

---

#### Current Home Address:

3616 Mallory Place  
Williamsburg, VA

Cell: 228.383.1997  
Office: 757.722.9961 ext. 3326

### EDUCATION:

#### Medical School

Degree: Doctor of Osteopathic Medicine  
School: Philadelphia College of Osteopathic Medicine  
Graduation Date: Jun 2004

#### Military Training Courses

Course: Aerospace Medicine Program (AMP)  
School: USAF School of Aerospace medicine  
Graduation: September 2005

#### Undergraduate:

Degree: B.S., Mathematics  
School: Troy State University  
Graduation Date: Dec 1995

Degree: A.S., Radiological Science  
School: Community College of the Air Force (CCAF)  
Graduation Date: Dec 1991

Degree: A.S., Nuclear Medicine  
School: Community College of the Air Force (CCAF)  
Graduation Date: Dec 1992

---

### PROFESSIONAL TRAINING AND EXPERIENCE:

**Radiology Residency:** David Grant Medical Center, Fairfield CA 94535

Completion Date: June 2012

**Medical Internship:** Internal Medicine, Keesler AFB, MS 39531

Completion Date: June 2005

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**LICENSURE AND SPECIALTY CERTIFICATION:**

Board Certification: Board Certified/ABR

Specialty: General Radiology

Current Unrestricted State License: Osteopathy and Surgery

I possess a current unrestricted license: Yes

License Number: 0102201806      State: VA      Expiration Date: 08/31/2020

---

**HONORS AND RECOGNITION:**

Undergraduate:

Troy State University (Magna cum Laude)

Alpha Sigma Lambda (Honor Society) Troy State University

Medical:

Radiology Apprentice Award)

Armed Forces of Pathology      2007

Combat & Casualty Course      2007

Advance Trauma Life Support      2006

FAA Aviation Medical Examiner Course      2006

School of Aerospace Medicine      2005

Military

ACC Flight Surgeon Safety Officer of the Year 2007

Group Superior Performer of the Month; 2<sup>nd</sup> Quarter 2007

Air Force Commendation Medal US Air Force, First Oak Leaf Cluster

Air Force Achievement Medal

Meritorious Unit Award, First Oak Leaf Cluster

AF Outstanding Unit Award, Fourth Oak Leaf Cluster

AF Good Conduct Medal, Fourth Oak Leaf Cluster

National Defense Service Medal

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**PROFESSIONAL COMMITTEES & APPOINTMENTS:**

Chief, Radiology Services Hampton VAMC      2016 to current

Intermittent, Acting Chief of Staff      2017 to current

Interim Diagnostic Imaging Flight Commander      2012 to 2016

Chief MSK & Nuclear Medicine Imaging      2012 to 2016

American Medical Association      2011 to Current

# **Keith Howard Newby, Sr., MD, FACC**

Fort Norfolk Plaza Cardiology Associates, Inc.

301 Riverview Ave, Suite 500

Norfolk, Virginia 23510

Phone (757) 624-1785 Fax (757) 644-4900

Email – [knewby@fnpma.com](mailto:knewby@fnpma.com)

## **CAREER GOALS: Health System Executive Vice President of Health Equity with an emphasis on Public Health**

### **CURRENT POSITION**

06/28/2021 - Present	Medical Director of Health Equity Sentara Health System
09/01/2010- Present	Cardiologist/Electrophysiologist – President Fort Norfolk Plaza Cardiology Associates, Inc
07/26/2005- Present	Newby Enterprises, LLC-President
02/09/2007 – 07/01/2012	Fort Norfolk Plaza, LLC- Co- Managing Partner
04/30/2007- Present	PMNK Development, LLC
2009- Present	James E. Newby Jr. M.D. Foundation- President
2009- Present	Newby Hotel Property Group, LLC- Managing Member d/b/a “The Public House” restaurant
2014 – Present	Chumeia, LLC- Managing Member d/b/a “Supper southern Morsels”

### **PREVIOUS POSITION**

07/01/1999 – 08/30/2010	Cardiologist/Electrophysiologist – President Cardiology & Arrhythmia Consultants, Inc.
07/01/1997 – 06/30/1999	Tidewater Heart Specialist Cardiologist / Electrophysiologist

### **HOSPITAL AFFILIATIONS**

Sentara Hospitals – Norfolk (Norfolk General Hospital)

### **CLINICAL APPOINTMENTS**

1999 - Present	Fellow, American College of Cardiology
02/01/1017 –	Assistant Professor of Medicine University of Virginia Department of Medicine; Division of cardiology
11/01/1997 – 12/01/2002	Director, Electrophysiology Laboratory Sentara Hampton General Hospital, Hampton, VA

## **POST GRADUATE EDUCATION**

01/02/2022 - Masters in Public Health Candidate  
University of North Carolina at Chapel Hill

## **POST GRADUATE TRAINING**

07/01/1993 – Fellow  
06/30/1997 Duke University Medical Center: Durham, NC  
Clinical training in Cardiology with emphasis in invasive Cardiac Electrophysiology

07/01/1991 – Residency  
06/30/1993 Emory University Medical School- Atlanta, GA  
Internal Medicine

07/01/1990 – Internship  
06/30/1991 Emory University School of Medicine: Atlanta, GA  
Internal medicine

## **EDUCATION**

08/1986 – 05/1990 Eastern Virginia Medical School: Norfolk, VA  
MD – Medicine

08/1981 – 05/1986 Norfolk State University: Norfolk, VA  
B.S. - Biology  
Minor in Music

## **BOARD CERTIFICATION/LICENSURE**

ABIM in Internal Medicine 1996

ABIM in Cardiovascular disease 1997

ABIM in Clinical Cardiac Electrophysiology 2000

Diplomate - National Board of Medical Examiners 1991

North Carolina Board of Medicine 1993

Virginia State Medical Board 1994

## **ACTIVITIES/COMMITTEES/APPOINTMENTS**

Visiting Assistant Professor of Medicine  
Department of Medicine, Division of Cardiology  
University of Virginia, Charlottesville, VA  
2017

Fourth Judicial Circuit Court of Virginia  
Judge appointed to the Jury Commissioners board for

Norfolk Circuit Court 2008

Commonwealth of Virginia  
Governor appointed to the Board of Trustees of the Virginia Tobacco Settlement  
Foundation 2006 – 2010

TowneBank Board of Directors  
Norfolk Board Director 2006

Commonwealth of Virginia  
Governor appointed to the Healthcare IT Council 2006

Norfolk Academy of Medicine  
President Elect 2006

Association of Black Cardiologists  
Board Member elected 2007

Association of Governing Boards  
of Universities and College

Board of Visitors Committee  
Eastern Virginia Medical School 2005-2007

Cardiac Credentialing Committee  
Sentara Norfolk General Hospital

Electrophysiology Sub-Committee  
Sentara Norfolk General Hospital

Cardiac Medicine Operations Committee  
Sentara Norfolk General Hospital

Cardiac Executive Leadership Committee  
Sentara Norfolk General Hospital

President, Dr. James E. Newby, Jr., Foundation  
Norfolk, VA – Founded 2009

President, Norfolk Medical Society  
Norfolk, VA 1998-2000

Cardiology Fellowship Selection Committee  
Duke University Medical Center 1993 - 1996

Minority Affairs Committee  
EVMS 1989-1990

Medical School Admissions  
EVMS 1986-1990

Anatomy Instructor  
EVMS Summer Work & Study Program 1987

Student National Medical Association  
President 1989-1990



Omega Psi Phi Fraternity  
Norfolk State University 1982

## **ACCOMPLISHMENTS**

Virginia Center for Inclusive Communities Tidewater Humanitarian Award 2022

2021 American Heart Association Grinnan Award

The United Negro College Fund Mayors' Masked Ball honoree 2019

Norfolk Education Foundation – 2015 Distinguished Alumni Awards recipient

Top doctors Hampton Roads 2012-2015

Hampton Roads Health Heroes Award 2014

Inside Business Most influential Power list 2012-2013

Patient choice awards – 2008-2012

Principal developer- Fort Norfolk Plaza medical complex - 2010

On-Time Doctor Award 2009

Urban League Norfolk Businessman of the Year Award- 2008

Capps Memorial Scholarship 1988

Medical Merit Award - Outstanding Achievement in Academic and  
Clinical Medicine 1990

Medical School Clinical Honors - Internal Medicine and Surgery

## **MEMBERSHIPS**

Association of Black Cardiologists

Medical Society of Virginia

American College of Cardiology

American College of Physicians

American Medical Association

American Society of Echocardiography (9/03)

Norfolk Academy of Medicine, Inc. (10/03)

Society for Vascular Ultrasound (2004)

## SPECIAL INTERESTS

Entertainment - Movies, Computer technology

Music - Saxophone, Trumpet, Gospel, Jazz, Classical, Rhythm & Blues

## RESEARCH EXPERIENCE / CLINICAL TRIALS

**Pfizer** “A Randomized, Double-Blind, Placebo Controlled Trial of the Effect of Weekly Azithromycin on the Incidence of Coronary Artery Disease in Subjects with Evidence of Exposure to C. Pneumoniae”, 1998-2001

**Ventritex** “Cadence TVL Lead Defibrillation System & V112, V1151105, 1996

**Medtronic** “AV Node Ablation & Pacemaker Implant as compared to Rate Control Medication in Patients with Chronic Atrial Fibrillation, 1996

**Contour** “LT Model V-135AC/145AC”, 1996

**Pfizer** “PO Dofetilide”, 1996

**Trilogy** “Pacesetter DRT Model 2360L & 2364L” Dual Chamber Pulse Generator, 1995

**Passive Plus** “Pacesetter DX Model 1342T & 1346T, 1995-1996

**Pfizer** “IV Dofetilide”, 1995-1996

**Medtronic** “PAC-A-TACH” Dual Study, 1995-1996

**Medtronic** “Model 7218C Lead Model 6936”, 1995-1996

## BIBLIOGRAPHY

### Manuscripts

1. **Newby KH**, Thompson T, Stebbins A, Topol EJ, Califf RM, Natale A. Sustained Ventricular Arrhythmias in Patients Receiving Thrombolytic Therapy, Incidence and Outcomes. *Circulation*. Dec 1998; 98 (23): 2567-2573
2. **Newby KH**, Pisano E, Green C, Krucoff M, Natale A. Incidence and Clinical Relevance of the Occurrence of Bundle Branch Block in Patients Treated with Thrombolytic Therapy. *Circulation*. Nov 1996; 94 (10): 2424-2428.
3. **Newby KH**, Moredock L, Rembert J, Wharton JM, Natale A. Impact of the Defibrillator Can Size on Defibrillation Success with a Single Lead Unipolar System. *American Heart Journal*. Feb 1996; 131(2): 261-265.
4. **Newby KH**, Zimmerman L, Wharton JM, Sorrentino R, Kent V, Kearney P, Brandon MJ, Natale A. Radiofrequency Ablation of Atrial Flutter and Atrial Tachycardia in Patients with Permanent Indwelling Catheters. *PACE* Nov 1996; 19 (11) I. 1612-1617.
5. Natale A, Sra J, Axtell K, Akhtar M, **Newby K**, Kent V, Pacifico A. Undetected Ventricular Fibrillation in Transvenous Implantable Cardioverter Defibrillators: Prospective Comparison of Different Lead System - Device Combinations. *Circulation*. Jan 1996; Vol. 93, 1: 91-98
6. Natale A, Kearney M, Brandon M, Kent V, Wase A, **Newby K**, Pisano E, Geiger M. Safety of Nurse Administered Deep Sedation for Defibrillator Implantation in the Electrophysiology Laboratory. *Journal of Cardiovascular Electrophysiology*. April 1996; Vol. 7, 4: 301-306.
7. Natale A, Sra J, Krum D, Dhala A, Deshpande S, Jazayeri M, **Newby K**, Wase A, Axtell K, VanHout W, Akhtar M. Relative Efficacy of Different Tilts with Biphasic Defibrillation in Humans. *PACE* February 1996; Vol. 19, 2: 197-206.

8. Tomassoni G, **Newby KH**, Kearney M, Brandon M, Barold H, Natale A. Testing Different Biphasic Waveforms and Capacitances: Effect on Atrial Defibrillation Threshold and Pain Perception. *Journal of American College of Cardiology*. September 1996; Vol. 28, 3: 695-9

#### Abstracts

1. **Newby KH**, Geiger M, Stinnett S, Wildermann N, Pisano E, Natale A. Clinical Relevance and Outcome of AV Block in Patients Treated with Thrombolysis. *PACE* April 1996, Volume 19, No. 4, Part II. Page 602 #147
2. Barold H, **Newby KH**, Tomassoni G, Brandon M, Geiger M, Kearney M, Natale A. Transmitral Valve Flow and Conduction Times During Dual Chamber Pacing with Different AV Delays at a Fast Rate. *PACE* April 1996, Volume 19, No. 4, Part II. Page 641 #301.
3. **Newby KH**, Barold H, Tomassoni G, Brandon MJ, Kearney M, Natale A. Dual Chamber Pacing with a Single Pass Multipolar Temporary Electrode Lead: Electrogram Amplitude and Pacing in the Atria from Free Floating Proximal Electrodes. *PACE* April 1996, Volume 19, No. 4, Part II. Page 719 # 615.
4. **Newby KH**, Stebbins A, Natale A. The Incidence and Clinical Outcome of Patients with Sustained Ventricular Arrhythmias in Patients receiving Thrombolysis. *Circulation*. October 1995; Vol. 92, 8: 2000, I 420.
5. **Newby KH**, Pisano E, Green C, Krucoff M, Natale A. Serial Changes in QT Dispersion after Thrombolytic Therapy: Is There Any Useful Information? *Circulation*. October 1995; Vol. 92, 8: 3265, I 680.
6. Geiger M, **Newby KH**, Natale A, et al. Impact of Defibrillator Implantation on the Outcome of Pregnancy . *Circulation*. October 1995; Vol. 92, 8: 3765, I 782.
7. Tomassoni G, Kearney M, Brandon MJ, Geiger M, Barold H, **Newby KH**, Natale A. Effect of Capacitance on Transvenous Atrial Defibrillation in Patients. *Circulation*. October 1995; Vol. 92, 8: 2258, I 473.
8. Natale A, Tomassoni G, Kearney M, Brandon MJ, Geiger M, Barold H, **Newby KH**. Catheter Ablation Approach on the Right Side Only for Paroxysmal Atrial Fibrillation Therapy. *Circulation*. October 1995; Vol. 92, 8: 1265, I 266.
9. Natale A, **Newby K**, Sra J, Wharton JM, Akhtar M. Defibrillation Efficacy of Biphasic Pulses in Humans: Importance of Duration and Peak Voltage of the Negative Phase. *PACE* April 1995. Vol. 18; 4 pt. II: 821, 102.
10. Natale A, **Newby K**, Wharton JM, Brandon MJ. Effects of AV Node Ablation and Pacemaker Implantation in Patients with Depressed Ejection Fraction and Chronic Atrial Fibrillation with Normal Ventricular Response. *PACE* April 1995. Vol. 18; 4 pt. II: 843, 192.
11. Natale A, Sra J, Dhala A, **Newby K**, Akhtar M. Redetection of Ventricular Fibrillation after Subthreshold Shocks: Prospective Analysis with Standard Bipolar and Integrated Bipolar Sensing Systems. *Journal of the American College of Cardiology*. Special Issue. February 1995 15A: 901-42
12. Natale A, **Newby K**, Moredock J, Rembert J, Wharton JM, Morris K. Reverse Polarity Biphasic Defibrillation with Three Biphasic Waveforms Using a Unipolar Defibrillation System. Abstract. *Journal of the American College of Cardiology*. Special Issue. February 1995. 278A: 767-3

## **Joseph Freedman, MD, MBA**

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Ft Myers, FL 33908

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### **Board Certifications**

Internal Medicine

Cardiovascular Disease

Comprehensive Adult Echocardiography with TEE, Level III, Director of Accredited ECHO lab

Cardiac CTA, Level III, Director of CTA program

Nuclear cardiology, Level III, Radiation Safety Officer, Director of Accredited Nuclear Lab

RPVI - eligible

### **Current Active State Medical Licenses**

Florida, South Carolina, Michigan, Illinois, Kansas, Missouri, New York, New Jersey, Virginia

### **Employment History**

8/16-present Cardiac Care Group, Medical Director.

Clinical noninvasive cardiologist in solo practice in Cape Coral, FL with approx. 6000 patients. Seeing 35 patients per day in clinic comprised of 75% Medicare, 25% commercial insurance. Fully accredited ECHO and nuclear stress lab in house. Full service vascular lab with ablation and sclerotherapy procedures for venous reflux disease. Advanced lipidology and preventative cardiology. Pacemaker clinic, Holter/EM/Life Vest clinic, also functioning as Radiation Safety Advisor (RSA). Work with home health to prevent CHF readmissions. 5 star ratings on ZocDoc and Healthgrades. Extensive media exposure on TV and through print adds as expert medical advisor for Fox News 4 local station.

7/14-7/16 Tenet Florida Physician Services (TFPS), Director of Cardiology Services. Lead noninvasive cardiologist at Florida Medical Center (FMC), a 459 bed accredited Chest Pain and Stroke center, continually ranked a national top 10% cardiovascular hospital. General outpatient clinic with emphasis on diagnostic testing, management of CAD, CHF, primary prevention, and general cardiology. Inpatient consult service with ARNP with focus on ER and floor consults, extensive CCU and ICU experience with expertise in noninvasive hemodynamic monitoring and treatment of complex cardiac admissions. Director of ASE accredited ECHO lab. Responsible for maintaining accreditation with 3rd party source including imaging standards to ASE guidelines, providing CME lectures for panel physicians, peer review, implementing new technologies such as 3D ECHO and strain imaging. Managed stress labs for exercise treadmill stress testing, nuclear stress testing, dobutamine stress ECHO, MUGA scans, thallium

protocol for viability studies, experience with cardiac FDG-PET and CMR viability. Head of nonacute chest pain team providing onsite cardiac CTA services to ER chest pain admission, responsible for hospital attaining level 5 Chest Pain accreditation with Society of Chest Pain Centers. Lowered length of stay for observation chest pain patients from >72 hours with traditional care plans to < 5 hours with ER CTA protocol. Structural heart disease imaging including CTA for TAVR, CT and TEE for Watchman device, and TTE/TEE for mitral clip. Valve clinic with surgical team for evaluation and follow up of all Mitral, Aortic, and misc. valve cases. Afib clinic with TEE/Cardioversion service and inpatient anti arrhythmic drug loading (tikosyn, sotalol). Device follow up including LINQ implantable monitors, E-cardio loop recorders, ECHO guided AV and VV optimization for Biventricular devices, ECG interpretation. Vein clinic with Covidien RF varicose vein ablation and outpatient clinic. Peripheral vascular disease imaging Carotid US, aortic US, peripheral vascular studies. VIP Cardiac CTA program with lipid VAP testing for cash paying patients interested in cardiac risk profiling. Extensive media experience with TV news interviews, I-heart Radio national programming, and online and print exposure. Extensive community and intrahospital lecturing on topics relevant to cardiology and peripheral vascular disease. Medical director of 3 nursing homes including rounding on admitted patients for acute and chronic cardiovascular conditions and integration of remote CHF monitoring technologies to prevent 30 day hospital readmission.

Clinical Research: Involved in office based clinical trials as investigator for protocols involving PCSK9 inhibitor pre FDA release, triglyceride lowering therapy, experimental weight loss drug, novel CMR protocol for coronary visualization. Current speaker for AstraZenica Cardiovascular Drugs.

1995-2004 Employment with MasterCard Intl, First Data Corp, and TCS Inc as international based business analyst in global high tech development projects prior to beginning MD career. Work and travel in 30+ countries.

## **Training and Education**

7/2011-6/2014 Fellowship: Cardiovascular Disease, Cleveland Clinic

7/2008-6/2011 Residency: Internal Medicine, University of Miami

7/2004-6/2008 Medical School: Sackler School of Medicine

1993-1995 MBA: Middlebury College/MIIS

1989-1992 B.S.: Georgetown University

## **Languages spoken**

Spanish, Hebrew

## **Joseph Freedman LLC, Owner**

Providing remote echocardiogram, vascular ultrasound, ECG, heart monitor, stress test, nuclear cardiology, cardiac CTA reads to various clients in multiple states.

Speaker for Astrazenica Pharmaceuticals, Jaansen Pharmaceuticals, Boehringer Ingelheim.

Consultant CVRx Medical Devices (Barostim)

Medical Director Pritikin Intensive Cardiac Rehab

# Randall L. Henciak

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Moyock, NC 27958

443.618.3183

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## Work Experience

- Sonographer, Hampton Roads Ultrasound 2016 to Present
  - Performed extracranial cerebral vascular, lower extremity arterial and lower and upper extremity venous as well as renal artery duplex examinations, aorta-iliac duplex examinations and groin duplex, breast, pelvic, OB, abdominal ultrasound with proficiency
- Sonographer, Baltimore Washington Medical Center 2009 to 2015
  - Performed breast, pelvic, OB, abdominal ultrasound with proficiency
- Sonographer, Advanced Radiology Outpatient 2010 to 2012
  - breast, pelvic, OB, abdominal ultrasound with proficiency

## Certifications

RDMS (OB, BR, AB) – 2009 and 2010

RVT – 2011

## Clinical Experience

- Highly efficient with scanning a variety of ultrasound exams: Obstetrics, Pelvic/TV, Abdomen/Renal, Breast, Small Parts (Scrotum, Thyroid), and Vascular (Carotid, LE/UE Arterial, LE/UE Venous)
- Assist with invasive procedures: Thoracentesis, Paracentesis, and Biopsies
- Proficient in operating Siemens, Toshiba, GE, and Philips ultrasound machines
- Experienced in departmental supply ordering and stocking
- Ability to work all departmental shifts with experience - Day, Evening, Night, Weekends, and On-Call shifts

## Education

UMBC Diagnostic Medical Sonography Program

Graduated August 2009

Concentration of Study – General

*University of Maryland Baltimore County*

*Baltimore, Maryland*

ASSOCIATE OF BIOLOGY, Cum Laude

Graduated December 2008

*Anne Arundel Community College*

*Arnold, Maryland*

Associate's Degree in Transfer Studies with Concentration in Biology

Charleston Southern University

Fall 2005 to Fall 2006

Concentration in Biology and General Studies

*Charleston, South Carolina*

## Awards

- Cum Laude Degree Honors
- Dean List Honors – Fall 2005, Fall 2007
- Athletic and Academic Scholarships - Fall 2005 through Fall 2006

## **Hampton Roads Ultrasound**

**Procedure: Ankle Brachial Index Screening , Single Level Segmental Pressure**

**Revised: 10/22**

**Patient prep:**

None

**Equipment and supplies needed:**

Arterial Physiological machine

Segmental pressure cuffs (12 cm, 10cm), two digital cuffs (2.5 cm)

Ultrasound gel

Towels, bed linens

Disinfectant spray

Gloves, probe covers

**Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study (previous history of PVD, CAD (s/p MI, angina), DM, HTN, elevated cholesterol, CVA, DVT/ SVT, smoker, strong family history of PVD, ESRD). Document cardiovascular surgeries (CABG with saphenous vein harvest, revascularization, CEA, dialysis access placement, vein stripped and ligated).
4. Ask the patient about previous studies (when, where and results).
5. Observe the patient's limb for surgical scars, ulcerations, trophic changes, or signs of arterial disease.
6. Ask the patient about symptoms (where, when, what and how).
7. Instruct patient to remove the clothing to have access to the lower limbs.
8. Instruct patient to lie down (supine position) and cover himself/herself with a sheet from the waist down. Ask patient if he/she needs assistance.
9. Drape patient so that only one limb is exposed for testing.
10. Apply ultrasound gel and with CW probe obtain Doppler signal from the following the arteries:  
**RT/ LT**
  - a. Posterior tibial artery (PTA)
  - b. Dorsalis pedis artery (DPA)
11. Obtain segmental pressures from the following sites:  
**RT/ LT**
  - a. Brachial artery (12 cm cuff)
  - b. Dorsalis pedis artery (DPA) (10 cm cuff)
  - c. Posterior tibial artery (PTA) (10 cm cuff)
  - d. Great toe (if amputated—use next available toe) (2.5 cm cuff)



13. Wipe the gel off the patient's skin. Wipe the gel off the probes and use the disinfectant towelettes.
14. Remove the cuffs. Wipe them and the PPG sensor with disinfectant towelettes.
15. Instruct patient to sit up and observe him/her for unsteadiness, dizziness. Instruct patient to get dressed.  
Ask the patient if he/she needs assistance.
16. Discharge patient. Change bed linen and set up the room for the next patient.
17. With disinfectant towelettes wipe the machine.
18. Wash hands.

## Tips and Pitfalls:

1. Patient must be in supine position during the study.
2. Warm feet and toes if the patient's extremities are cold to prevent false positive results.
3. Probe angle between 0-60° to attain accurate Doppler signal.
4. Determine the appropriate segmental cuffs to obtain accurate pressures as follows:
  - arm = 12 cm width cuff
  - ankle = 10 cm width cuff

The cuff width should be at least 50% greater than limb diameter to measure pressure accurately. Make adjustments according to limb girth.

5. The presence of medial calcification in the arterial wall results in non-compressible and/ or falsely elevated pressures.

This finding is identified among patients who are diabetics or patients who have large or swollen ankles. The digital pressures are relied on to assess arterial occlusive disease.

Document the limitations stating the unreliability of the ankle pressures and the ABI's. Waveform analysis is utilized to interpret exam results.

6. Doppler signals may not be obtainable in cases when the limbs have severe arterial occlusive disease with low flow. Distinguishing between the venous and arterial flow may be difficult. Perform gentle proximal or distal compression to augment the venous signal and the arterial signal may be detected-diminished flow or unchanged.

7. In cases when a stenotic signal is heard: the post-stenotic turbulence and bi-directional flow affect the spectral tracing. Move the probe slightly more proximal or distal to the high grade turbulence, to obtain a signal with direction.

8. At the arterial bifurcation (i.e. femoral), there is signal ambiguity. To compensate, move the probe cephalad to obtain a signal.

9. In large patients use a lower frequency probe to obtain a representative Doppler signal from the femoral and/ or popliteal artery.

10. Use generous amount of gel when obtaining a weak arterial signal. Place the probe on the gel with no skin contact. This prevents unintentionally compressing the artery therefore obliterating the signal.

11. Limbs with oozing fluid, wounds, suspect lesions---**USE PROBE COVERS** and use universal precautions. Cover the break in the skin with cloth before applying segmental cuffs.

12. Hyperemic waveforms are encountered with patients who have cellulitis, or wounds distal to sites being assessed. Determining accurate waveform morphology (multiphasic vs. monophasic) may be difficult. Document the limitation.

13. Defer taking brachial blood pressure from patients with functioning dialysis access, s/p mastectomy, or post op surgery on one of the upper extremities. Record a pressure on the available arm. Document this limitation.

## INTERPRETATION GUIDELINES:

### 1. Taking a good history is extremely helpful in interpreting the test results.

2. Claudication refers to a muscular ache or cramp involving the muscles of the buttocks, thighs, or calves but not the feet. Pain location localizes the disease. Pain in the buttocks or thighs may indicate aortoiliac disease. Pain in the calves may indicate SFA disease.

Patients with acute arterial insufficiency will present: Pain, Pallor, Pulselessness,  
Paresthesia, Paralysis, Poikilothermia (limb coolness)

### 3. ABI and DBI ANALYSIS

ABI = Highest ankle systolic pressure ÷ Highest arm systolic pressure

<u>Ankle Brachial Indices</u>	<u>Degree of Arterial Insufficiency</u>
> .96	Normal
.80 - .95	Mild arterial insufficiency
.50 - .79	Moderate arterial insufficiency
.20 - .49	Severe arterial insufficiency
< .20	Critical ischemia (rest pain)

---

Single level occlusion > .50

Multiple level occlusions < .50

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DBI = Highest digit pressure ÷ Highest arm systolic pressure

Toe (Digital Brachial Index – DBI) ≥ .60 Normal  
< .60 Abnormal  
< .30 (Rest pain/ digital ischemia)

Note: Normal toe pressure is 60% of ankle blood pressure or greater.

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Fingers (DBI) ≥ .80 Normal  
< .80 Abnormal  
< .56 isolated/ digital arterial lesions

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## Waveform analysis: LARGE VESSELS

- ***Triphasic*** – consists of three components: a sharp systolic upstroke and two diastolic waves (reversed flow followed by forward flow)
- ***Biphasic*** – consists of two components: a sharp systolic upstroke and reversed diastolic flow
- ***Hyperemic*** – consists of continuous forward flow throughout systole and diastole. The signal retains the multiphasic morphology.
- ***Monophasic*** – The flow is forward throughout systole and diastole. The diastolic signal is lost.
  - Distal to significant stenosis > 50% exhibits monophasic waveform. As the stenosis progresses, the waveform loses amplitude, increasing systolic rise time (SRT).
  - Stenotic site exhibits a high-pitched sound with turbulence. The high velocity is above the spectral baseline.
  - Distal to an occlusion with poor collateralization exhibits flat and non-pulsatile Doppler signals.

Reference: Non-invasive Peripheral Vascular laboratory diagnostic techniques by Nix, L, Barnes, R, Published by Medical College of Virginia.

6. If there is vessel calcification use waveform analysis.

7. Doppler waveforms change in amplitude and contour distal to significant stenosis.

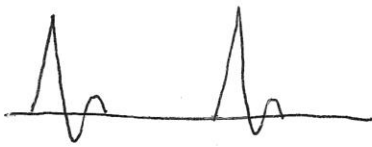
Degree of stenosis correlates to the distortion of the Doppler waveform.

Observe the waveform morphology.

8. In cases when there is moderate stenosis and waveforms exhibit normal morphology: Exercise may help detect the disease. Post exercise femoral waveforms may show sub-critical iliac lesions.

# Lower extremity arterial waveforms

## 1. Normal

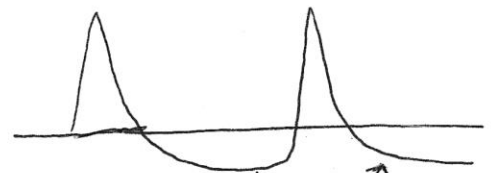


Triphasic



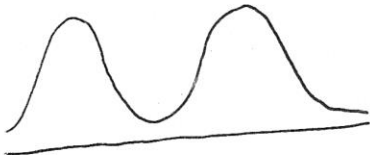
Biphasic

5.



venous drag  
artifact, improve angle;  
move medially or  
laterally.

## 2. Abnormal



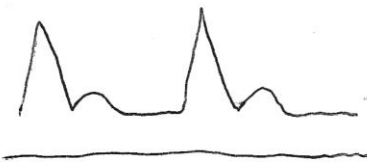
monophasic



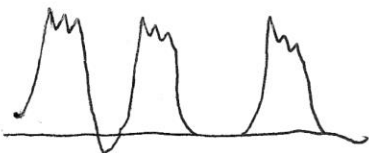
monophasic

## 3. Hyperemia

- maintains multiphasic nature

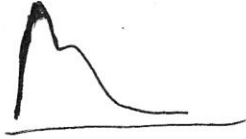


## 4. ~~Turbulent~~ Turbulent - over stenosis



# PPG waveforms

1. Normal



Sharp upstroke  
narrow peak  
dicrotic notch on downslope

2. mild



Sharp upstroke  
narrow peak  
loss of dicrotic notch

3. Moderate



moderate delay in upstroke  
rounded peak

4. Severe



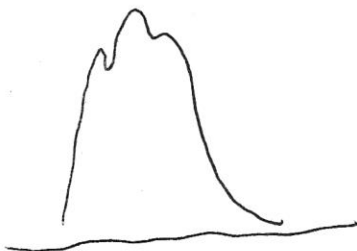
diminished amplitude  
noticeable increase in systolic rise time

5. critical

non-pulsatile



Additional change



cold sensitivity - Raynaud's  
anachrotic notch  
peaked peak

## REFERENCES:

1. Barnes, RW and Wilson, MR: Doppler Ultrasonic Evaluation of Peripheral Arterial Disease, Iowa City; University of Iowa, 1976.
2. Zwiebel, WJ, Introduction to Vascular Ultrasonography, 3<sup>rd</sup> ed, WB Saunders, 1992, pp 201-221.
3. Case, TD, Primer of Non-invasive Vascular Technology, 1<sup>st</sup> ed, Little, Brown, 1995, pp 249-266.

# **HAMPTON ROADS ULTRASOUND**

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## **Procedure: Aorta Duplex Screening**

**Date Revised: 10/22**

### **Patient prep:**

The study must be scheduled in the morning due to fasting prep requirement. Patient should fast for 8-12 hours to decrease bowel gas. Bowel gas can interfere with obtaining optimal images and spectral Doppler flows. Instruct patient not to chew gum or smoke prior to the study. Patient can have a sip of water to take a.m. medications.

Note: If a patient arrives for the test and inadvertently did not fast, perform the test and state any limitations.

### **Equipment and supplies needed:**

Duplex system with transducers: C5-2, P4-2 (if available)

Ultrasound gel

Towels, bed linen

Disinfectant towelettes

Gloves, probe covers

### **Patient position:**

Begin with patient in the supine position with head slightly elevated.

Lateral decubitus and right decubitus positions are used to obtain adequate “windows.”

### **Breathing Technique:**

Normal respiration.

Deep held respiration.

---

### **Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Confirm patient identity. Ask and record pertinent medical information related to the study (previous history of AAA, dissection, HTN, DM, CAD, PVD, DVT).  
Document recent cardiovascular surgeries/ procedures (CABG, revascularization, catheterization, arteriogram, angioplasty with stent, or thrombectomy).
4. Document where and when the surgery/ procedure was performed.
5. Ask the patient about previous studies (when, where and results).
6. Inform the patient about the duration of the test. Before starting, ask patient if he/she needs to use the restroom. There are instances when a patient uses the restroom frequently due to medication; therefore, make allowances should he/she needs a break during the study.
7. Instruct patient to expose the abdomen and drape him/her so that only area of interest is exposed for scanning.
8. Instruct patient to lie down (supine position) on the bed.

Note: Different patient positions and breathing techniques should be utilized to obtain desired results.



10. In TRANSVERSE gray scale view, survey the entire abdominal aorta to the bifurcation (common iliac arteries).
11. In TRANSVERSE gray scale view, measure the largest external diameter of the abdominal aorta at either of the following sites:

**Proximal**

**Mid (At the renal level)**

**Distal (Terminal)**

**Bifurcation (common iliac arteries)**

In SAGITTAL gray scale view, obtain images from the corresponding area with the largest diameter of the following sites:

**Proximal aorta**

**Mid aorta**

**Distal aorta,**

**Bilateral common iliac arteries.**

Obtain images of abnormal findings: dilatation, dissection, AVF, pseudoaneurysm, vascular injury, mass, lesion, collection, hematoma, or intraluminal debris (plaque, thrombus, calcified walls).

Note: Body habitus can limit gray scale imaging, use color to locate the aorta and visceral branches are used as landmarks to locate the specific sites.

12. Once aortic dilatation is detected, look for intraluminal thrombus. Measure the dilated segment in TRANSVERSE and SAGITTAL views. Measure diameter reduction when intraluminal thrombus is visualized in TRANSVERSE view, when possible.  
Document the location of the visceral arterial branches (celiac axis, superior mesenteric artery (SMA), renal arteries, and inferior mesenteric artery (IMA)) relative to the dilatation.  
Once dilatation of these arterial branches is detected, measure in TRANSVERSE and SAGITTAL views.
13. Once aortic dissection is detected, determine if it extends into the arterial branches. Obtain color spectral Doppler from the arterial branches. Determine if the dissection can reduce or can terminate the blood supply to the branches.
14. Wipe off the gel from the patient's skin. Wipe off the gel from the transducer(s) followed by disinfectant spray.
15. Assist patient to sitting position. Instruct patient to sit up quietly and observe any unsteadiness, dizziness. Ask if he/she needs assistance.
16. If the result is negative for significant findings inform the patient that the official report will be sent to them and their primary care physician within three business days and discharge the patient.
17. If the result is **POSITIVE** for significant findings (dilatation/ aneurysm, dissection, stenosis > 50%, thrombus, mass, lesion, collection, or hematoma), instruct patient to get dress, designate the exam as urgent and flag for physician interpretation, results will be called to the participant within 48 hours.

18. Change bed linen and set up the room for the next patient.
19. Wash hands if visibly soiled. Alcohol disinfect hands if not visibly soiled.
20. Change bed linen and set up the room for the next patient.

### **Tips and Pitfalls**

1. In large patients, use the low frequency transducer.
2. Transverse, sagittal, and/ or oblique views are essential to assess the abdominal aorta completely. There are cases when the study is technically difficult due to bowel gas and body habitus and document limitations.
3. Right decubitus position is another approach to assess the abdominal aorta. Obtain images and measure the aortic diameter.
4. In the case of embolization, expand the study to include the femoral and popliteal arteries to determine the presence of the aneurysm.
5. Aneurysms are often largest in transverse rather than the anterior posterior dimension. Transverse dimension is important.
6. To determine whether the aneurysm involves the renal arteries:
  - Use color to visualize the renal arteries origins and measure the distance from the vessels to the aneurysm.
  - When renal arteries are not clearly identified, their location may be referred by measuring the distance from the SMA to the aneurysm. The renal arteries arise from 1-1.5 cm inferior to SMA.

## INTERPRETATION GUIDELINES:

1. Normal abdominal aorta has smooth margins and tapers in size gradually from the diaphragm to its iliac bifurcations. It can be very tortuous.
2. External diameter measurements of abdominal aorta should not exceed 3.0 cm. In many adults, the maximum diameter rarely exceeds 2.5 cm.
3. Normal iliac arteries are smooth and uniform in caliber. The maximum external diameter of the common iliac artery (CIA) is generally 1.5 cm. External iliac artery is slightly smaller in size but is sonographically difficult to visualize.
4. Aneurysm refers to dilatation of a blood vessel is generally localized. There is a tendency for aneurysms to form in the distal aorta and in the proximal iliac arteries.
5. Pathology terms of aneurysm:

**True aneurysms** - involve the three layers of the arterial wall but stretched.

Atherosclerotic aneurysm evolves from disease process weakening the vessel wall, causing dilatation.

### Types:

#### **Bulbous**

#### **Fusiform – typically spindle shaped**

#### **Saccular – show dilatation on the vessel wall anteriorly**

#### **Ectatic – diffuse dilation (external diameter: 3.0-6.0 cm) and involves the entire length of the vessel**

**False aneurysms (pseudoaneurysms)** – generate from extravasation caused by iatrogenic arterial puncture, violent trauma, or infection agent (thereby destroying the arterial wall). The escaped blood forms a hematoma confined by the surrounding tissue and the blood circulates from the parent artery in the non-thrombosed center of the hematoma, resulting in a pulsating mass.

**Dissecting aneurysms** – form due to weakening of the media of the vessel and the developing a tear in the intima through which blood leaks into the media. They are caused by uncommon conditions (e.g. Marfan's syndrome), idiopathic, or atherosclerosis.

6. Once an aortic dissection is detected, obtain spectral color Doppler from the false lumen to show patency. An abnormal hemodynamics ("systolic blip") is obtained from a false lumen that does not re-enter into the vessel wall. Abdominal aortic dissection often increases the external aortic diameter.
7. In cases when a patient's aortic proximal diameter is measured 1.5 cm and distally it measures 3.0 cm., state that distal segment diameter is dilated compared to the proximal segment and does not taper normally.
8. Aneurysms in the external iliac arteries are isolated cases usually just beyond the bifurcation of common iliac arteries.
9. Expected aortic hemodynamics:
  - Suprarenal (proximal) and at the level of the renal arteries (mid): waveform does not have a flow reversal in early diastole
  - Infrarenal and terminal levels(distal): waveform has a brisk systolic upstroke, rapid deceleration in early diastole with brief flow reversal and the resumption of forward flow in late diastole.

10. At the suprarenal level (proximal), when monophasic signal with delayed systolic rise time (SRT) is obtained, this indicates aortic valve stenosis or probable aortic coarctation.

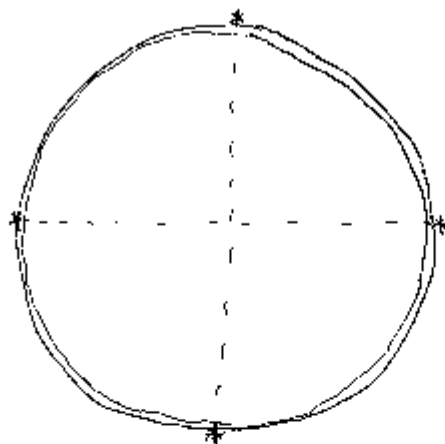
11. Diameter reduction in the abdominal aorta is obtained easily due to its large vessel.

12. The following table below is from the recommendation by Strandness, et al:

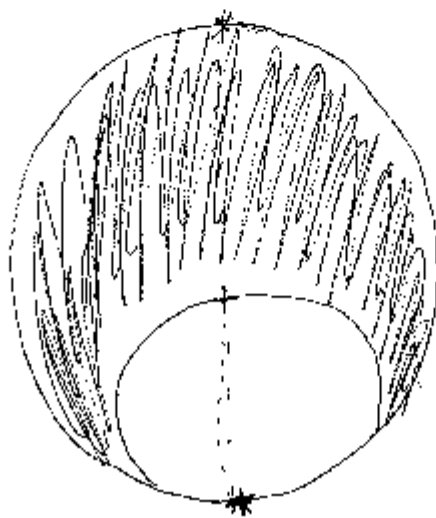
Normal	Triphasic waveform At the level of renal arteries, the diastolic flow is forward
1–19%	Wall irregularities Spectral broadening No increase in PSV
20-49%	Increase in PSV > 30% but < 100% from the segment immediately preceding it. Reverse component of diastole is unchanged.
50-99%	> 100% increase in PSV within the narrowed area Loss of reverse flow Marked spectral broadening
Occlusion	No signals obtained from the segment of interest

13. Concentric layers of thrombus usually line the wall of large aortic or iliac aneurysms and this thrombus plays an important role as a source of distal arterial embolization. Sonographically the thrombus is low to medium in echogenicity and sometimes appears laminated. The presence of the thrombus the outer dimensions of an aneurysm may be greater than the dimensions of the lumen.

1. When measuring aneurysms measure the external diameter

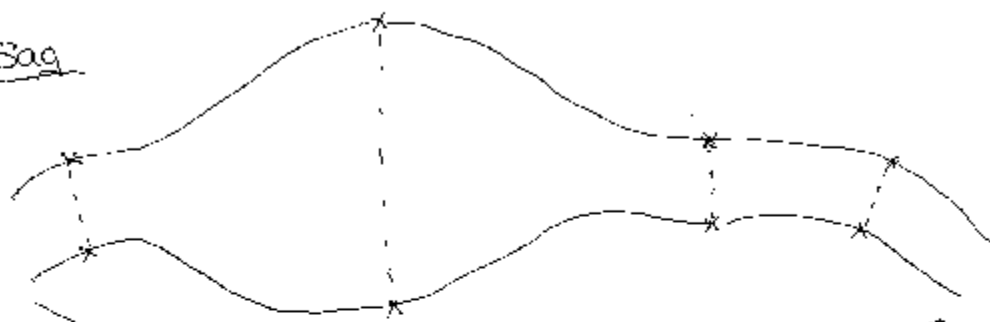


2. If thrombus is present obtain diameter reduction

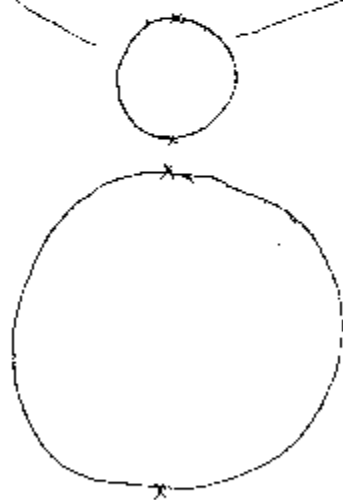


3. Obtain longitudinal view of aneurysm and perform serial measurements to further delineate extent of aneurysm. Perform the same measurements in transverse view and

Sag



Transverse



## REFERENCES:

1. Bluth, EI: Ultrasound of the abdominal aorta. Arch Intern Med 1984; 144: 377-380.
2. Steiner, E, et al: Sonographic examination of the abdominal aorta through the left flank: A prospective study. J Ultrasound Med 1986; 5: 499-502.
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6. Strandness, ED: Duplex scanning Vascular disorders, Raven Press, 1990, pp 121-145.
7. Gill, K: Abdominal ultrasound: A practitioner's guide. WB Saunders, 2001.
8. Tempkin, BB: Ultrasound Scanning: Principals and Protocols, 2<sup>nd</sup> ed. WB Saunders, 1999, pp 27-39 and pp 343-365.

## **Hampton Roads Ultrasound**

### **Procedure: Carotid screening**

**Revised: 10/22**

#### **Patient prep:**

None

#### **Equipment and supplies needed:**

Duplex system with transducers: L7-4, L12-5

Ultrasound gel

Blood pressure cuff and Doppler

Towels, bed linen

Disinfectant towelettes

Gloves, probe covers

#### **Protocol:**

1. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study.
2. Patient in supine position and expose the neck region by tilting and rotating the patient's head away from the side being examined.
3. Drape towel around the neck. Apply ultrasound gel. Start on the right side.
4. In TRANSVERSE gray scale survey, begin at the clavicle and proceed cephalad along the common carotid artery. The common carotid bifurcates into internal and external carotid arteries.
5. Follow the external and internal carotid arteries cephalad, examining the internal carotid closely.
6. Note presence of disease, intraluminal defect, and/ or mass.
7. Use different approaches (anteromedial, posteromedial, anterolateral, posterolateral) to show good image quality in transverse and sagittal views.
8. In SAGITTAL gray scale survey, scan the common carotid artery and move cephalad to the bifurcation. Identify internal and external carotid arteries.
9. With color and spectral Doppler, record velocity (PSV and EDV) from the proximal and distal common carotid artery. Note presence of disease and disturbed flow.



10. Survey the bifurcation and then identify both internal and external carotid arteries in different approaches.
11. Once external carotid artery is identified, obtain spectral Doppler and record velocity sample. Note presence of disease and disturbed flow.
12. View the internal carotid artery from the bifurcation and then moving cephalad to the mandible. Record representative velocities from proximal, mid, or distal segments record velocity from the area with the greatest narrowing of the vessel. Note presence of disease and flow disturbance.
13. Angle corrected velocities should be at  $60^\circ$  whenever possible. Angles  $45\text{-}60^\circ$  are acceptable where the vessel is ectatic. Angle correct when encountering tortuous vessels (kinking or coiling).
14. Describe plaque morphology:
15. Patients who have had surgeries such as CCA bypass, transposition bypass, subclavian bypass, survey the vascular reconstruction. Include the following: the inflow native artery, proximal anastomosis, graft (proximal, mid, distal), distal anastomosis, outflow native artery, and segments where disease or anomalies were visualized. Record velocities throughout the graft. Note any abnormal hemodynamics and other findings.
- 16. Angle correction should be to the vessel wall, in the case of irregular plaque that has caused a significant velocity shift angle correct to the new flow channel created by irregular plaque.**
17. Repeat steps on the contralateral side.
18. Wipe off the gel from the patient's neck. Wipe off the gel from the probe(s) with towel followed by disinfectant towelette.
19. Assist patient to sitting position. Instruct patient to sit quietly and observe any unsteadiness, dizziness. Inform patient the official report will be sent to the referring physician within two business days and discharge the patient.
20. Change table linen and set up the room for the next patient. Wash hands.

***25. REQUIRED IMAGES WITH LABELS:***

**Gray scale image of the following: TRANSVERSE views (Bifurcation, abnormal findings)**

**SAGITTAL views (ICA, abnormal findings)**

**Color with spectral Doppler image of the following:**

**SAGITTAL view (proximal, mid or distal ICA, and abnormal findings)**

## INTERPRETATION GUIDELINES:

### INTERNAL CAROTID grading system:

<u>Percent Stenosis</u>	<u>Criteria</u>
0%	No disease
1-49%	PSV < 125 cm/s PSV ICA/ CCA ratio < 1.5
50-69%	PSV > 125 cm/s PSV ICA/CCA ratio > 1.5
70-79%	PSV > 325 cm/s EDV < 140 cm/s PSV ICA/CCA ratio > 4.0
80-99%	EDV > 140 cm/s
100%	Occlusion      Absent spectral Doppler

Based on criteria set forth in the following reference: Moneta, GL, Edwards, JM, Correlation of North American Symptomatic Carotid Endarterectomy Trial (NASCET) Angiographic definition of 70-99% internal carotid stenosis with duplex scanning, JVS 1993; 17: 152-9

1. Abnormal hemodynamics (turbulence, spectral broadening, delayed SRT, decreased velocities, periods of reversed flow, or frank “steal” in the carotids and/ or vertebrals) are observed with severe proximal stenosis in the vertebral artery, innominate artery, common carotid artery and proximal external carotid artery.
2. Arterial dissection is associated within trauma or with inherent weakness of the arterial wall. Aortic arch dissection may extend to the common carotid artery, subclavian artery and vertebral artery. Internal carotid dissection may descend from a rent that begins from the base of the skull. The duplex findings associated with carotid dissection are dramatic when the loosened intima flutters back and forth in the flow stream with each cardiac cycle, but this may not always be seen.
  - 1 Once carotid dissection is detected, collect the following information:
    - Extent of dissection
    - Determine whether the dissection is ascending from the chest or descending from ICA at the base of the skull
    - Document the presence, direction and characteristics of flow in each lumen
    - Examine closely the flow characteristics in the ECA and ICA and determine the effects of the dissection on the ICA circulation and to detect collateralization and

- Note dissections that healed (thrombosed). This resembles a fibrous plaque in the artery that often extends to the whole length of the carotid artery.
4. Arterial occlusion can be diagnosed with duplex imaging if the following are observed:
    - 1 Absence of arterial pulsations
    - 2 Lumen filled with echogenic material
    - 3 Subnormal vessel size (chronic occlusion)
    - 4 Absence of flow (color or Doppler signal)
    - Occlusion can be differentiated from severe stenosis with only a trickle of flow, because the flow velocity in the residual lumen was too sluggish to produce a detectable Doppler shift.  
 The low velocity flow in a tiny residual lumen cannot be detected unless the Duplex parameters are adjusted to display very slow flow rates.  
 A false positive diagnosis of occlusion is a significant error, because a stenotic lesion is potentially remediable and an occluded vessel is assumed to be uncorrectable.
  5. Examine the bifurcation closely if the CCA is occluded. Check the ECA and ICA for patency and direction of flow. These arteries may be open with retrograde flow in the ICA supplied by the ECA and the collaterals.
  6. To identifying the ICA from the ECA, perform a tap on the superficial temporal artery (arterial branch of the ECA). This is helpful when there is significant stenosis in the bifurcation and distinguishing the carotid arteries is difficult.
  7. In the carotid bulb normal flow disturbance is expected. This is evident when surveying the ICA with Doppler. There is a brief period of decreased velocities and bi-directional flow in the carotid bulb. Undisturbed flow in the bulb may indicate underlying disease.
  8. Angle correction should be to the vessel wall, in the case of irregular plaque that has caused a significant velocity shift angle correct to the new flow channel created by irregular plaque. When velocities are elevated in the extracranial arteries with normal or no significant stenosis, consider compensatory flow due to presence of disease on the contralateral side. A second cause would be the patient has an overall enhanced flow state and both sides will have elevated velocities. Third cause would be fibromuscular dysplasia (FMD), which is found in the distal ICA.
  9. Ectatic arteries and endarterectomy sites produce low velocities. Measure the diameter of ectatic arteries.
  10. If a patient has previous history of trauma/ injury on the neck or complains of neck pain, observe closely for intramural hemorrhage, dissection, hematoma, AVF, pseudoaneurysm, or mass/ collection. Once mass/ collection is identified, measure in transverse and sagittal views.
  11. Carotid body tumor is a vascularized mass found at the bifurcation. It is located between

the ICA and ECA. Use color flow the spectral Doppler to show vascularity (low resistance with high diastolic flow) within the mass. Describe and draw these findings.

12. Consider distal obstruction (intracranial involvement) when abnormal hemodynamics ("blips) are recorded in the extracranial arteries.
13. Measure diameter reduction of an artery in transverse view. This applies to CCA, or SCA with intraluminal plaque. Do not measure diameter reduction of the ICA with intraluminal plaque.
14. The extracranial arteries originate from the right innominate artery. Abnormal hemodynamics are recorded in the carotid arteries (reversed or partially reversed→reversed in systole and prograde in diastole). This finding is consistent with significant stenosis in the innominate artery.

#### **REFERENCES**

1. Zwiebel, WJ, Introduction to Vascular Ultrasonography, 3<sup>rd</sup> ed, WB Saunders, 1992, pp 79-143.

## **Hampton Roads Ultrasound**

### **Procedure:      Echo screening**

**Revised: 10/22**

#### **Patient prep:**

None

#### **Equipment and supplies needed:**

Duplex system with transducers: P2-5

Ultrasound gel

Towels, bed linen

Disinfectant towelettes

Gloves, probe covers

#### **Protocol:**

1. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study.
2. Patient in supine position and expose the neck region by tilting and rotating the patient's head away from the side being examined.
3. Drape towel around upper body. Apply ultrasound gel. Start on the left side.
4. The examination is begun by positioning the patient in the left lateral decubitus position.
5. The transducer is placed in the third or fourth intercostal space to the left of the sternum, with the index marker pointed to the patient's right shoulder at approximately the 9 to 10 o'clock position.
6. If possible, the left ventricle should appear positioned perpendicular to the ultrasound beam within the image sector. If the ventricle does not appear relatively horizontal, the transducer may be moved to a higher parasternal window or the patient turned to a steeper left lateral decubitus position. In a majority of patients, the apex should not be seen in the PLAX view. The appearance of a "false apex" and a short left ventricle may be eliminated by rotating, tilting, and/or angling the transducer, thus maximizing the LV cavity length within the field of view.
7. The PSAX views are obtained by rotating the transducer 90° clockwise from the PLAX view to position the beam perpendicular to the long axis of the left ventricle.
8. Several anatomic structures are imaged by tilting the transducer first superiorly and then progressively inferiorly to multiple levels. The first image begins at the level of the great vessels (aorta and PA). In this view, the aorta above the valve is seen in cross section, and the RVOT, PV, main PA, and beginning of the left and right branches of the PA are visualized. Image quality and structure visualization may be improved by moving the

transducer up one interspace. A clip should be recorded at this level.

9. Tilting inferiorly reveals the PV, AV (all three leaflets), and TV aligned from right to left across the sector.
10. An initial larger sector view should be taken to view the left atrium directly below the AV, the interatrial septum, and the transition to the right atrium. Portions of the left atrial (LA) appendage may be visible on the right side of the sector in some patients.
11. In the upper sector, care should be taken to demonstrate the transition of the right ventricle from the inflow to the outflow positions. Each valve should be interrogated using manipulation of the sector size or use of the zoom function. A clip should be taken of the zoomed AV to demonstrate leaflet number and motion. At this level, further fine manipulation can demonstrate the origin of the left main coronary artery at about 3 to 5 o'clock in the area of the left coronary cusp.
12. Additional transducer movement toward the right coronary cusp may show the origin of the right coronary artery at about 11 o'clock.
13. Views of the origin of the coronary arteries are not considered part of the routine examination. Given variable clinical needs of the population served, each echocardiography laboratory should develop a policy on routine inclusion of imaging of the coronary artery origins. Next, the sector should be adjusted to demonstrate the anatomy and motion of the TV leaflets. Also, the full right atrium, the inflow section into the right ventricle, and areas around the high ventricular septum should be demonstrated. Multiple clips may be needed at this level. After interrogating the TV, the transducer is angled toward the RVOT and PV and a clip acquired.
14. From the level of the great vessels, the transducer is tilted inferiorly and slightly leftward toward the apex of the heart, stopping at the level of the MV.
15. In this view, maximum excursion of both the anterior and posterior leaflets of the MV should be clearly demonstrated. The right ventricle appears as a crescent at the top and left portions of the sector. The anterior, lateral, and inferior walls of the left ventricle are visible. Settings should be adjusted to obtain a clear view of the free wall. A clip should be taken showing the MV and RV.
16. Next, the transducer is tilted to a location just inferior to the tips of the mitral leaflets, at the level of the papillary muscles.
17. The ventricle should appear circular, and the papillary muscles should not wobble. This is approximately at the mid-LV level and is a particularly important view to judge LV global and regional function. Imaging settings should be carefully adjusted to optimally demonstrate myocardial motion and thickening. The right ventricle continues to be present at the anterior and medial portion of the sector. At least two clips at this level should be acquired.
18. The last PSAX video clip to be acquired is at the level of the apical third of the ventricle.
19. This may require tilting or sliding the transducer down one or two rib interspaces and laterally to best see the apex. The right ventricle is usually no longer present in the sector.

## 20. C Apical Views

21. After the PSAX views are completed, the apical window is next to be interrogated.
22. The apical position is usually found on the left side of the chest near the point of maximal impulse, aligned near the midaxillary line, as most people present with levocardia. A good starting point is the fifth intercostal space, but it should be noted that

there is often more than one apical window that can be used during the examination. The term *axis* has been used for the ideal projection of ultrasound through the apex of the ventricles, atrioventricular valves, and atria in a vector that maximizes the long axis of the heart.

23. Ideally, this view would be available in every patient, allowing optimal image quality. However, this is not always the case, as ultrasound transmission is limited to the rib interspaces. Changes in cardiac structure due to cardiac pathology and changes in the structure of the thoracic cavity may also render the ideal view impossible. To best position the transducer for the apical views, a specialized cut-out bed that better exposes the apex is strongly recommended. Throughout the examination, repositioning of the patient may improve image quality of various apical views. In general, when imaging in the apical window in a normal heart, the long axis from the base of the left atrium to the apex of the left ventricle should consist of about two thirds left ventricle and one third left atrium. This is a helpful subjective guide to know that the left ventricle is not being foreshortened. In addition, the left ventricle should taper to an ellipsoid shape at the apex. If the ventricle is foreshortened, the apex will appear more rounded.

#### **24. 1 A4C View**

25. The first apical view to be acquired is the A4C view. To obtain this view, the transducer is placed at the palpated apical impulse with the index marker oriented toward the bed. The image is optimized so that all four chambers are seen, with left-sided structures appearing on the right side of the displayed sector and right-sided structures on the left.
26. In the normal heart, the apex of the left ventricle is at the top and center of the sector, while the right ventricle is triangular in shape and considerably smaller in area. The myocardium should be visible uniformly from the apex to the atrioventricular valves and the moderator band identified in the apical part of the right ventricle. Full excursion of the two mitral leaflets and two of the tricuspid leaflets (septal and posterior or anterior) should be identified. The walls and septa of each chamber should be visualized to assess for size and performance measurements.
27. Observing this view during respiration allows the operator to assess for ventricular interdependence, septal motion abnormalities, and aneurysmal atrial septal motion. The initial video clip should encompass a full view of all four chambers, including full visualization of the atria to put overall chamber size into perspective. To facilitate quantification and observation of regional wall motion, the sector size should be reduced to include only the ventricles. This smaller sector size is also recommended for longitudinal strain imaging and 3D volume acquisition.
28. An additional one or two 2D clips, as well as additional clips for advanced imaging, should be recorded at this level of magnification.
29. The SC window is used to assess the heart, pericardium, RV free wall thickness, and great vessels located in the abdomen (IVC and SVC, hepatic veins [Hvns], and abdominal aorta). It can be very useful for imaging the heart when the images are suboptimal from the parasternal window.
30. The SC view is obtained with the patient laying supine with abdominal muscles relaxed. Having the patient bend his or her knees may help relax the stomach muscles, thereby making the views easier to obtain. The image may be further improved by acquiring it during held inspiration.



### **31. 1 SC Four-Chamber View**

32. SC imaging begins with the transducer placed on the patient's abdomen at the junction of the rib cage (xiphoid process), with the index marker pointed to the patient's left, at about a 3 o'clock position. The transducer is pointed toward the patient's left shoulder, transecting the heart in a four-chamber orientation. From this image, the right atrium, TV, left atrium, MV, left ventricle, interatrial septum, and interventricular septum can be examined.
33. This view is particularly important to assess the interatrial and interventricular septa for defects, and the RV wall thickness, as the ultrasound beam is perpendicular to each septum. A video clip should be recorded.

### ***Two-Dimensional Measurements***

#### **1 Left Ventricle**

The PLAX view should be used for linear measurements of the left ventricle. LV wall thicknesses and chamber dimension are measured at end-diastole, defined as the first video frame immediately after mitral leaflet closure.

If mitral motion is not visible, end-diastole may be identified as the peak of the R wave on the electrocardiogram. The image should demonstrate the chamber along its center axis to maximize dimension. Papillary muscles should not be visible in the PLAX view. An electronic caliper is positioned at the interface of the compacted myocardium of the interventricular septum and a line extended perpendicular to the long axis of the left ventricle to the inner border of the compacted myocardium of the posterior wall. The measurement should be obtained at a level just below the MV leaflet tips.

The interventricular septum and LV posterior wall should be measured at the same time and level as the LV end-diastolic dimension. Only the compacted tissue of the septum should be included in the measurement, taking care to avoid including RV trabeculae, the insertion of the moderator band, or the TV apparatus as septal thickness.

For measurement of the interventricular septum, the caliper should be placed at the interface where the RV cavity meets the compacted interventricular septum and moved to where the interventricular septum meets the LV cavity.

For measurement of the LV posterior wall, the caliper should be placed at the interface of the compacted posterior wall and LV cavity and moved to the LV posterior wall-pericardial interface.

Care must be taken to avoid including the MV apparatus in the measurement. The cine loop should be advanced frame by frame to aid in differentiating posterior wall from leaflets and chordae tendineae. The LV end-systolic dimension should be obtained at the smallest cavity

dimension, usually the frame preceding the initial early diastolic opening of the MV, just distal to the MV leaflet tips.

An exception to this rule involves the presence of isolated thickening of the basal septum (sigmoid septum or septal bulge). In this case, the measurement location in systole and diastole should be moved slightly toward the LV apex to just beyond the septal bulge, making all linear measurements at this level.

The measurements should remain perpendicular to the long axis of the ventricle

**Required imaging:**

4 chamber view

Left ventricle view measurement

Right ventricle view and measurement

Mitral valve with flow and Doppler

Tricuspid valve with flow and Doppler

Aorta valve with flow and M-Mode

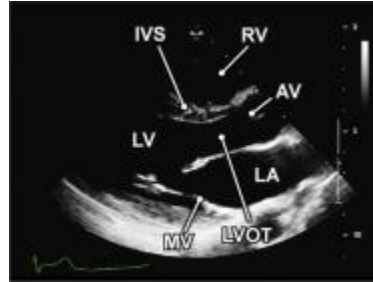
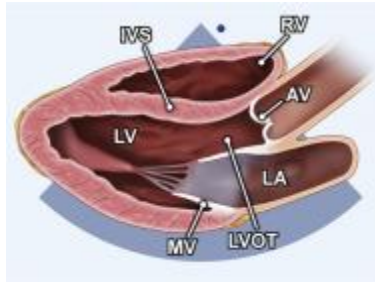
Ejection fraction

## **Abbreviations:**

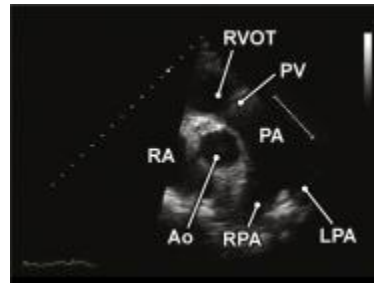
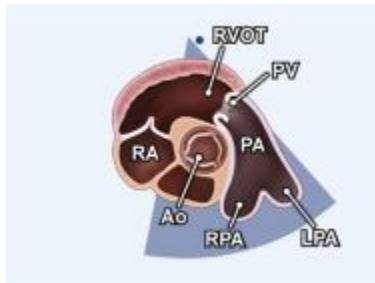
**2D (Two-dimensional), 3C (Three-chamber (apical long axis)), 3D (Three-dimensional), 4C (Four-chamber), 5C (Five-chamber), A2C (Apical two-chamber), A4C (Apical four-chamber), Abd Ao (Abdominal aorta), ALPap (Anterolateral papillary muscle), AMVL (Anterior leaflet mitral valve), Ao (Aorta), AR (Aortic valve regurgitation), Asc Ao (Ascending aorta), ASE (American Society of Echocardiography), AV (Aortic valve), CDI (Color Doppler imaging), CS (Coronary sinus), CW (Continuous-wave), Desc Ao (Descending aorta), DTI (Doppler tissue imaging), HPRF (High-pulse repetition frequency), Hvns (Hepatic vein), IAS (Interatrial septum), Innom a (Innominate artery), IVC (Inferior vena cava), IVS (Interventricular septum), LA (Left atrial), LCC (Left coronary cusp), LCCA (Left common carotid artery), L innom vn (Left innominate vein), LSA (Left subclavian artery), LV (Left ventricular), LVIDd (Left ventricular internal dimension diastole), LVIDs (Left ventricular internal dimension systole), LVOT (Left ventricular outflow tract), LVPW (Left ventricle posterior wall), MPA (Main pulmonary artery), MR (Mitral valve regurgitation), MS (Mitral stenosis), MV (Mitral valve), NCC (Noncoronary cusp), PA (Pulmonary artery), PFO (Patent foramen ovale), PLAX (Parasternal long-axis), PMPap (Posteromedial papillary muscle), PMVL (Posterior leaflet mitral valve), PR (Pulmonic valve regurgitation), PRF (Pulse repetition frequency), PSAX (Parasternal short-axis), Pulvn (Pulmonary vein), PV (Pulmonic valve), PW (Pulsed-wave), RA (Right atrium), RCA (Right coronary artery), RCC (Right coronary cusp), R innom vn (Right innominate vein), ROI (Region of interest), RPS (Right parasternal), RV (Right ventricular), RVIDd (Right ventricular internal dimension diastole), RVOT (Right ventricular outflow tract), SC (Subcostal), SoVAo (Sinus of Valsalva), SSN (Suprasternal notch), STJ (Sinotubular junction), SVC (Superior vena cava), TAPSE (Tricuspid annular plane systolic excursion), TGC (Time-gain compensation), TR (Tricuspid valve regurgitation), TTE (Transthoracic echocardiographic), TV (Tricuspid valve), UEA (Ultrasound enhancement gent), VTI (Velocity-time integral)**

Reference imaging

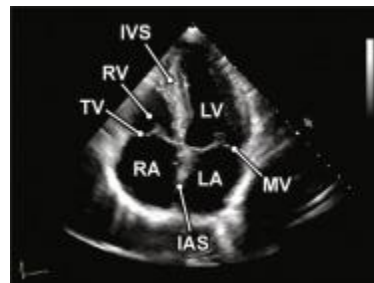
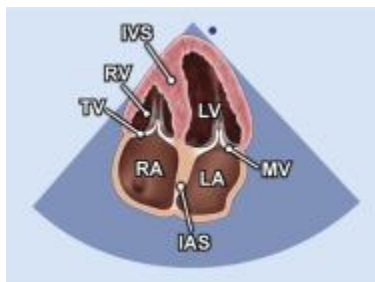
PLAX Left ventricle



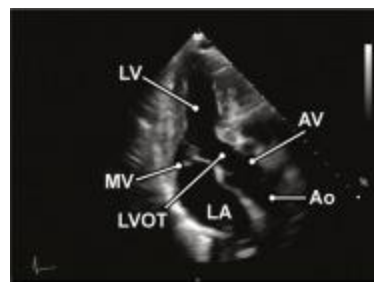
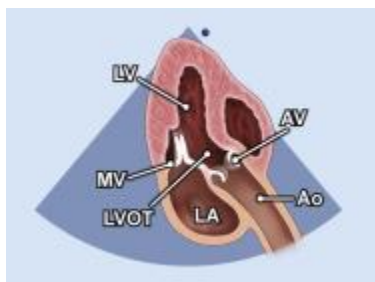
Parasternal short axis



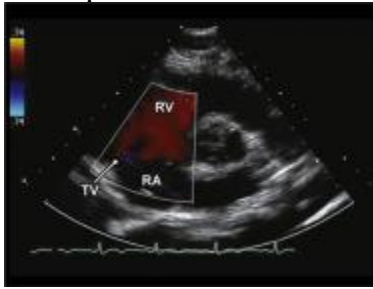
4 Chamber view



Apical long axis



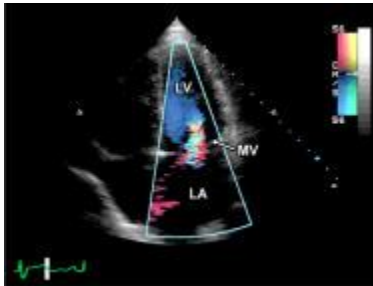
Tricuspid valve



Mitral valve



4 chamber view



## References

[https://www.onlinejase.com/article/S0894-7317\(18\)30318-3/fulltext#secsectitle0545](https://www.onlinejase.com/article/S0894-7317(18)30318-3/fulltext#secsectitle0545)

# **HAMPTON ROADS ULTRASOUND**

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## **Procedure: Kidney and Bladder Screening**

**Revised: 10/22**

### **Patient prep:**

- The study must be scheduled in the morning due to fasting prep requirement.
- Patient should fast for 8-12 hours to decrease bowel gas. Bowel gas can interfere with obtaining optimal images and spectral Doppler flows. Instruct patient not to chew gum or smoke prior to the study.
- Patient can have a sip of water to take a.m. medications.
- Note: If a patient arrives for the test and inadvertently did not fast, perform the test and state any limitations.

### **Equipment and supplies needed:**

Duplex system with transducers: C5-2, P4-2 (if available)

Ultrasound gel

Towels, bed linen

Disinfectant spray

Gloves, probe covers

### **Patient position:**

Begin with patient in the supine position with head slightly elevated.

Left lateral decubitus and right lateral decubitus positions are used to obtain adequate “window.”

### **Breathing techniques:**

Normal respiration

Deep, held respiration or the Valsalva maneuver

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### **Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study (previous history of AAA, dissection, renal tumor, HTN, DM, CAD, PVD, DVT). Document recent cardiovascular surgeries/ procedures (CABG, revascularization, nephrectomy, catheterization, arteriogram, angioplasty with stent, thrombectomy, or biopsy).
4. Document where and when the surgery/ procedure was performed.
5. Ask the patient about previous studies (when, where and results).
6. Inform the patient about the duration of the test. Before starting, ask patient if he/she needs to use the restroom. There are instances when a patient uses the restroom frequently due to medication; therefore, make allowances should he/she needs a break during the study.
7. Instruct patient to expose the abdomen and drape him/ her so that only area of interest is exposed for scanning.
8. Instruct patient to lie down (supine position) on the bed.

Note: The sequence and positioning of the patient in the following protocol may vary according to sonographer's preference.

9. Different patient positions and breathing techniques should be utilized to obtain desired images.

#### RENAL

- Longitudinal images of each kidney
- Measurement of the maximum length in longitudinal dimension
- Color flow images of both kidneys
- Transverse images bilaterally of mid poles
- Measurements of mid poles bilaterally
- At least one image to demonstrate the liver/kidney interface

#### BLADDER

- Longitudinal and transverse images of the urinary bladder
- Measurements in AP, transverse, and longitudinal dimensions of the bladder pre and post void, whenever possible
- At least one image to demonstrate the liver/kidney interface

Use color to show renal perfusion.

Look for color bruit or abnormal high velocities in the affected artery and vein suggestive of AVF.

Look for arterialized collection with to-fro track suggestive of pseudoaneurysm.

In gray scale look for cyst, complex cyst, echogenic mass, or vascularized mass.

Identify hydronephrosis, and/ or hydroureter in TRANSVERSE and SAGITTAL views.

Ask patient to empty his/her bladder to document if the hydronephrosis is resolved or unchanged.

10. Wipe off the gel from the patient's skin. Wipe off the gel from the transducer(s) followed by disinfectant towelettes.
11. Assist patient to sitting position. Instruct patient to sit up quietly and observe any unsteadiness, dizziness. Ask if he/she needs assistance.
12. If the result is negative for significant findings inform the patient that the official report will be sent to the referring physician within two business days and discharge the patient.
13. If the result is negative for significant findings inform the patient that the official report will be sent to him/her within three business days and discharge the patient.
14. If the result is **POSITIVE** for significant findings designate the exam as urgent and flag for physician interpretation, results will be called to the participant within 48 hours.
15. Change bed linen and set up the room for the next patient.



16. Wash hands if visibly soiled. Alcohol disinfect hands if not visibly soiled.

## **Tips and Pitfalls**

### **1. There are reasons for inadequate surveillance:**

Obesity

Bowel gas

Uncooperative patients: respiratory difficulties, chronic pain (back, abdominal)

Previous abdominal scars

- Document the limitations

### **2. Before stating the presence of hydronephrosis.**

Obtain images of the affected kidney(s) in two states:

Show the kidney(s) with a full bladder

Show the kidney(s) post void (empty bladder)

Attempt to measure the enlarged pelvis both pre and post void; mention any decrease in size

### **3. Differentiating extrarenal pelvis, dilated renal vein, hydroureter and hydronephrosis.**

- Extrarenal pelvis occurs when a normal renal sinus is associated with a dilatation of the renal pelvis.
- A dilated renal vein can be followed to the IVC.
- Hydroureter is accumulation of urine in one of the ureter leading from the kidneys to the bladder.
- Hydronephrosis is the dilatation of the renal pelvis and calyces caused by obstruction of the urinary tract.

## INTERPRETATION GUIDELINES:

1. Arteriovenous fistula (AVF) may develop post partial nephrectomy. These fistulas can become large and communicate directly with renal veins or major venous tributary.

Expected findings include:    Enlarged renal vein and/ or aneurysmal main renal artery  
  “Arterialized” renal venous system  
  Focal elevated arterial velocity  
  Distinct turbulence at the fistula site  
  Radiating color bruit

Parenchymal AVF may develop post renal biopsy or associated with malignancy. Record elevated velocities. Small fistulas may not demonstrate abnormal hemodynamics described above.

2. Cysts are sonographically recognized by: thin, smooth clearly define margins, hypoechoic or anechoic, acoustic enhancement of the posterior wall. Most cysts exhibit benign features, but some also contain low-level echoes from debris or hemorrhage. They may be single, multiple or septated.

3. Hydronephrosis is dilatation of the renal pelvis and calyces caused by obstruction of the urinary tract.

If the obstruction is at the level of the urethra, the hydronephrosis is bilateral.

If the obstruction is along the ureter or the ureteropelvic junction, the hydronephrosis is unilateral.

The calyces and infundibula (tube connecting the renal pelvis to the calyx) can be traced to the pelvis.

The calyces can be obscured a simple large sac is seen. The renal parenchyma may thin out due to untreated and chronic hydronephrosis.

The ureter may become dilated (hydroureter).

Kidney stones (calculi) produce acoustic shadowing.

Solid masses are typically heterogenous and smooth or have irregular borders.

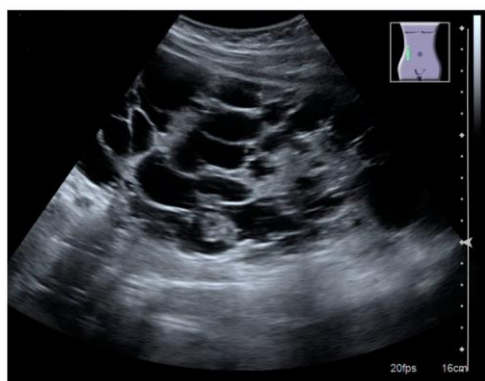
## Common kidney pathology



Simple cyst with posterior enhancement



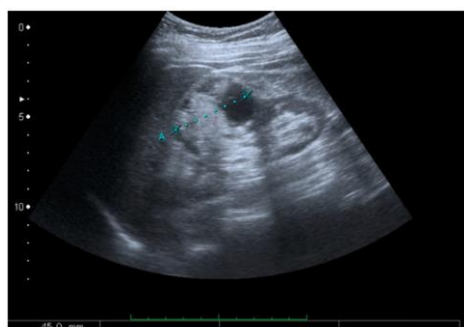
Complex cyst with thickened walls and membranes in the lower pole of an adult kidney. Measurements of kidney length and complex cyst



Advanced polycystic kidney



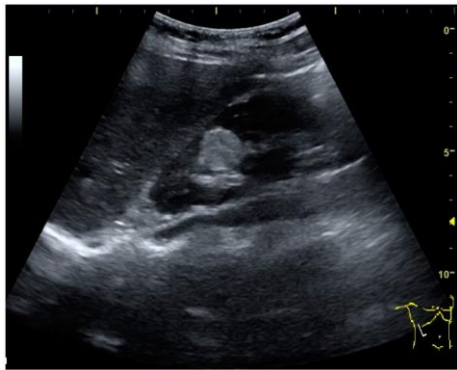
Renal cell carcinoma



Renal cell carcinoma with both cystic and solid components



Solid tumor in the renal sinus seen as hypoechoic mass, later found to be lymphoma



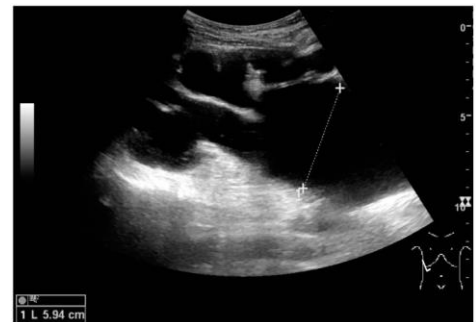
Angiomyolipoma seen as hyperechoic mass in upper pole of adult kidney



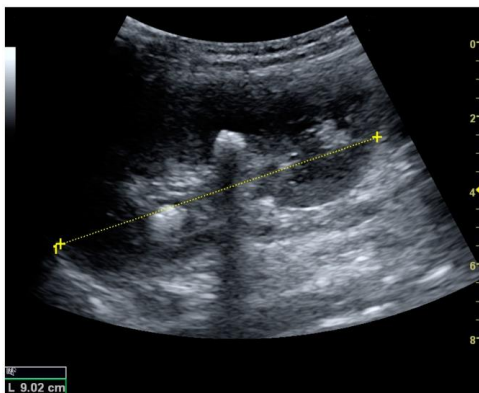
Tuberous sclerosis and multiple angiomyolipomas in the kidney



Hydronephrosis due to ureteropelvic junction obstruction



End stage hydronephrosis with cortical thinning

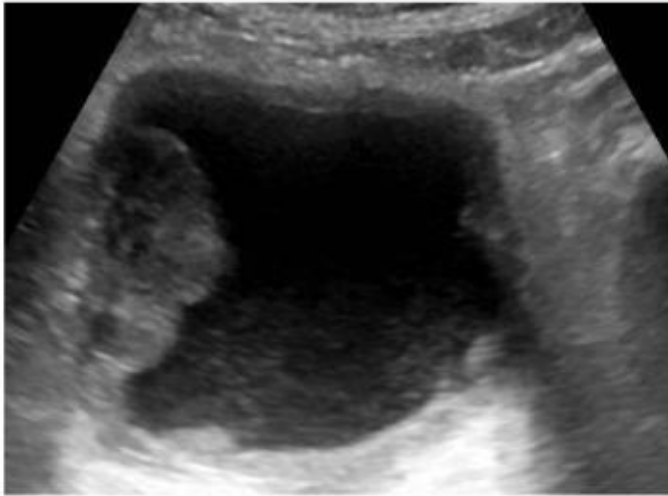


Centrally located stone with posterior shadowing

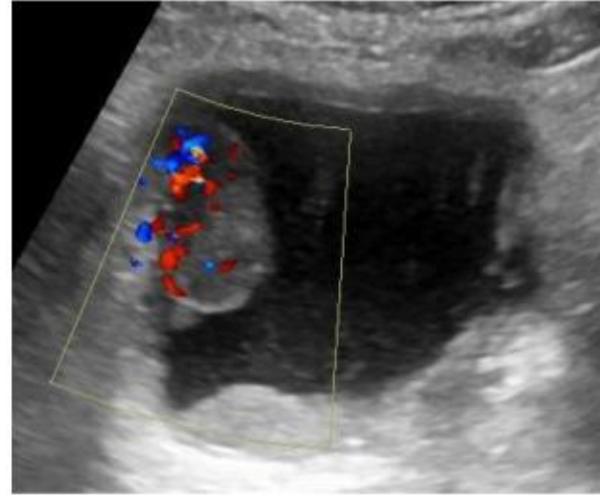


Chronic renal disease

## Bladder Pathology



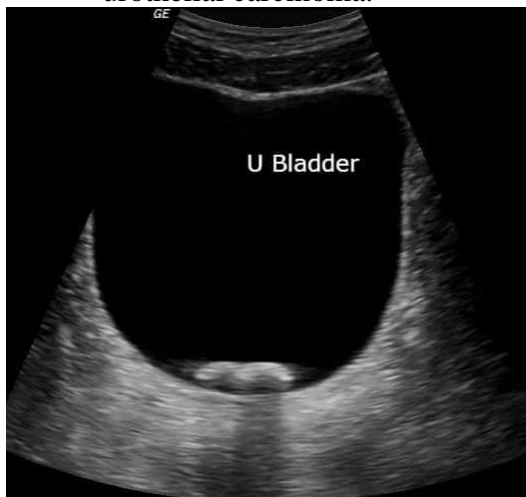
(a)



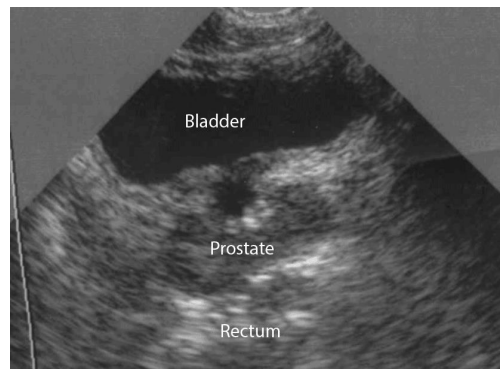
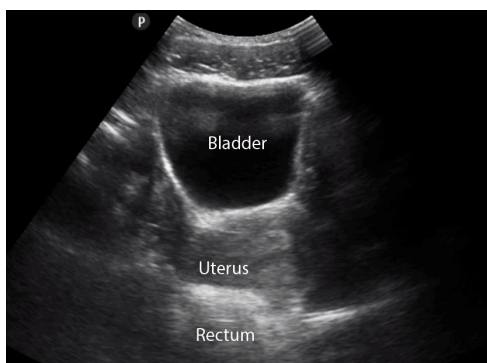
(b)

(a) Transverse image of well defined echogenic mass in the right lateral bladder wall

(b) Color doppler ultrasound detected the presence of vascularity in the mass, later found to be urothelial carcinoma.



Bladder stone with posterior shadowing



## REFERENCES:

1. Zweibel, WJ: Introduction to Vascular Ultrasonography. 3<sup>rd</sup> ed. WB Saunders, 1992, pp 387-405.
2. Tempkin, BB: Ultrasound Scanning: Principals and Protocols. 2<sup>nd</sup> ed. WB Saunders, 1999, pp 101-121 and pp 343-365.
3. Zierler, E, et al: The use of duplex scanning in the diagnosis of renal artery disease, JVT 1987; 11: 44-447.
4. Miralles, M, et al: Value of Doppler parameters in the diagnosis of renal artery stenosis, JVS 1996; 23: 428-435.
5. Olin, JW, et al: The utility of duplex ultrasound scanning of the renal arteries for diagnosing significant renal artery stenosis, Ann Intern Med 1995; 122: 833-838.
6. Hansen KL, Nielsen MB, Ewertsen C. Ultrasonography of the Kidney: A Pictorial Review. Diagnostics (Basel). 2015 Dec 23;6(1):2. doi: 10.3390/diagnostics6010002. PMID: 26838799; PMCID: PMC4808817.

## **Hampton Roads Ultrasound**

Procedure: Abdominal - liver, gall bladder and spleen

### **Patient prep:**

The study must be scheduled in the morning due to fasting prep requirement.

Patient should fast for 8-12 hours to decrease bowel gas. Bowel gas can interfere with obtaining optimal images and spectral Doppler flows. Instruct patient not to chew gum or smoke prior to the study.

Patient can have a sip of water to take a.m. medications.

Note: If a patient arrives for the test and inadvertently did not fast, perform the test and state any limitations.

### **Equipment and supplies needed:**

Duplex system with transducers: C5-2, P4-2(if available), L7-4

Ultrasound gel

Towels, bed linen

Tech worksheet

Disinfectant towelettes

Gloves, probe covers

### **Patient position:**

Begin with patient in the supine position with head slightly elevated.

Left lateral decubitus and right lateral decubitus positions are used to obtain adequate “window.”

### **Breathing techniques:**

Normal respiration

Deep, held respiration or the Valsalva maneuver

### **Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study (previous history of AAA, dissection, HTN, DM, CAD, PVD, DVT, PE). Document recent cardiovascular surgeries/ procedures (CABG, revascularization, catheterization, arteriogram/ venogram, angioplasty with stent, thrombectomy, IVC filter placement, or biopsy)
4. Document where and when the surgery/ procedure was performed.
5. Ask patient about previous studies (when, where and results).
6. Inform the patient about the duration of the test. Before starting, ask patient if he/she needs to use the restroom. There are instances when a patient uses the restroom frequently due to medication; therefore, make allowances should he/she needs a break during the study.
7. Instruct patient to expose the abdomen and drape him/her so that only area of interest is



exposed for scanning.

8. Instruct patient to lie down (supine position) on the bed.

Note: The sequence and positioning of the patient in the following protocol may vary according to sonographer's preference.

10. Different patient positions and breathing techniques should be utilized to obtain desired images.

♦ In TRANSVERSE and SAGITTAL gray scale view, survey the liver, spleen and vasculature (splenic vein, superior mesenteric vein (SMV), segments of IVC, hepatic artery, hepatic veins, portal veins)

♦ In TRANSVERSE and/ or SAGITTAL gray scale view, obtain images of the following sites:

spleen  
liver  
gallbladder

Abnormal findings: abnormal liver, cirrhosis, areas of liver compression, ascites, intraluminal thrombosis or debris, collaterals, enlarged spleen, varicosities, vessel dilatation, mass, hematoma, cyst,

Obtain the necessary measurements when abnormal findings are identified.

♦ Obtain color and spectral color Doppler of areas of pathology

Abnormal findings: stenosis, intraluminal thrombosis or debris, collaterals, varicosities, vessel dilatation, mass, collection, or hematoma

11. Scanning steps:

- 1 Obtain cross-sectional view of the splenic vein to the SMV. With brief breath holding by the patient, record the patency and flow direction with color spectral Doppler of the splenic vein at the SMA crossover. Observe for intraluminal debris or thrombus in the splenic vein.
- 2 Survey the SMV in a transverse view. Observe for vein dilatation or intraluminal debris or thrombus. In sagittal view, with brief breath holding by the patient, record the patency and flow direction with color spectral Doppler. Observe for varicosities.
- 3 Return to the confluence of the confluence of the splenic vein to the SMV in cross-sectional view. In sagittal view, survey the extrahepatic portal vein. With brief breath holding by the patient, record the patency and flow direction with color spectral Doppler.

Observe for intraluminal debris or thrombus and presence of collateral veins.

Follow the portal vein into the liver hilum. With brief breath holding by the patient, record the patency and flow direction with color spectral Doppler of the right and left portal veins. Follow the left portal vein into the left lobe of the liver. Examine the ligamentum teres for signs of patent paraumbilical vein and hepatofugal flow.

- 2 In sagittal view of the hepatic artery (in either two sites: at the extrahepatic position or at the portal hepatis), record PSV and EDV with color spectral Doppler while patient performs brief breath holding. Observe for signs of prominent, enlarged size and abnormal hemodynamics (elevated velocities and bruit).
  - 3 Obtain cross-sectional view of the liver to access the hepatic veins. With the sub-costal approach, angle superiorly to obtain cross-sectional view of the hepatic veins.
  - 4 Utilize color to identify the hepatic veins. With brief breath holding by the patient, record color spectral Doppler.  
Another approach to visualize the hepatic veins is left lateral decubitus position.
    - 1 With a high intercostal window, the right and middle hepatic veins are accessible. Observe for intraluminal debris or thrombus and abnormal flow direction in one or more of the veins.
    - 2 In supine and/ or right lateral decubitus position, obtain sagittal and transverse measurements of the spleen. Observe the spleno-renal border for signs of varicosities and spontaneous spleno-renal shunting. Utilize color spectral Doppler to record patency and flow direction, with brief breath holding by the patient, of the splenic vein at the hilum.
12. Wipe off the gel from the patient's skin. Wipe off the gel from the transducer(s) followed by disinfectant towelettes.
  13. Assist patient to sitting position. Instruct patient to sit up quietly and observe any unsteadiness, dizziness. Ask if he/she needs assistance.
  14. If the result is negative for significant findings inform the patient that the official report will be sent to the referring physician within three business days and discharge the patient.
  15. If the result is **POSITIVE** for significant findings designate the exam as urgent and flag for physician interpretation, results will be called to the participant within 48 hours.
  16. Change bed linen and set up the room for the next patient.
  17. Wash hands if visibly soiled. Alcohol disinfect hands if not visibly soiled.

***REQUIRED IMAGES with LABELS:***

**Gray scale image of the following:**

**Spleen with measurement**

**Liver with measurement**

**Gallbladder with measurement**

***Abnormal findings: Abnormal liver, cirrhosis, ascites, stenosis, intraluminal thrombus/ debris, collaterals, varicosities, vessel dilatation, mass, hematoma, cyst, areas of compression.***

## **INTERPRETATION GUIDELINES:**

1. Normal portal vein diameter in an adult is 7-12 mm. Portal vein has continuous, slightly pulsatile hepatopetal flow. In fasting state the velocities range from 8-18 cm/s in adults and in nonfasting children 10-30 cm/s.

Portal HTN decreases or increases depend on the collateral pathways.

To distinguish the portal vein from the IVC, assess the waveform morphology. IVC feeds the systemic circulation.

There are instances when the portal vein is a duplicate system.

Portal vein and its tributaries lie in a fibrous, highly reflective bed in comparison to hepatic veins.

2. Increased pulsatility in the portal veins suggests the following: right heart failure, tricuspid regurgitation, portosystemic communications and hepatic artery – portal vein fistulas.
3. Reversed flow in the portal vein occurs in severe Grade 4 portal HTN, Budd Chiari, or portosystemic shunts.
4. Hepatic veins are the largest of the visceral tributaries to the IVC. They enter the IVC at the level of the diaphragm. The right hepatic vein drains the right lobe.  
The middle hepatic vein drains the caudate lobe.  
The left hepatic vein drains the left lobe.
5. Superior mesenteric vein (SMV) is normally larger than SMA and lies to the right of the SMA. Flow is hepatopetal. In fasting state the velocities range from 10-30 cm/s. The SMV has a quasi steady with slight pulsatile, hepatopetal flow.

Enlarge SMV is seen in portal HTN.

SMV thrombosis is rare and occurs in association with abdominal inflammatory process.

6. Splenic vein flow is normally continuous with very slight pulsatile variations. Flow is hepatopetal.

In portal HTN, the splenic flow is normally directed in at the hilum but retrograde at the confluence of the SMV.

Portosystemic collaterals may be found at the superior splenic border or through spleno-renal collaterals.

The splenic vein enlarges in portal HTN.

7. Sonographic findings associated with portal HTN are the following:

Portal vein diameter > 13 mm (supine, quiet respiration)

< 20% increase in SMV or splenic vein diameter from quiet respiration to deep inspiration

Portosystemic collaterals

Hepatofugal flow

Pulsatile portal vein flow

Splenomegaly

8. Grades of Portal Hypertension:

GRADE I and GRADE II (MILD)	→	Decrease flow in portal vein
	→	Increase diameter of portal vein
	→	Collateral shunts begin to open

GRADE III	→	Further decrease in portal vein flow
	→	Increase in size and flow rate in hepatic artery
	→	Possible stagnant flow in portal vein

GRADE IV	→	Reversal flow in portal vein
	→	Flow supplied solely by anterior portal shunts

9. In addition to obtaining abnormal direction in the portal vein, carefully survey for possible varicose veins and signs of portosystemic shunting.

Varicose veins may be identified at the cardia of the stomach, at the gastroesophageal junction, at the splenorenal border.

Portosystemic shunting can be seen through the umbilical vein and through splenorenal collaterals.

Shunting of portal flow out the left renal vein may result in enlargement of the renal vein with increased flow velocities and turbulence.

10. Hepatic artery supplies a low resistance vascular bed and normally has high forward diastolic flow.

- 1 Stenosis is suggested by elevated PSV > 220 cm/s followed by post stenotic turbulence.
- 2 Increased velocities, in absence of stenosis, may suggest portal HTN (due to reduced flow in the portal vein), portal vein thrombosis, or hepatic inflammatory processes.
- 3 The presence of AVF, involving hepatic artery to portal vein, increase the flow velocities in the hepatic artery with associated turbulence.

11. Thrombosis of the portal vein and its tributaries are caused by:

cirrhosis

intra-abdominal sepsis

direct invasion or compression by neoplasm  
post op complications  
pancreatitis or the inflammatory diseases  
trauma  
dehydration  
coagulation disorders and blood dyscrasias  
neonatal omphalitis  
idiopathic factors

- 1 Acute to subacute thrombosis, the portal vein diameter may enlarge > 13 mm with patient supine and quiet respiration.
- 2 Chronic thrombosis may be normal in size, small, or undetectable.
- 3 Thrombus can be occlusive or non-occlusive
- 4 Carefully survey for collaterals at the porta hepatis and for arterialization of the liver. The hepatic artery has prominent branches and is tortuous.

12. Budd-Chiari can involve occlusion of the venous outflow of the liver at any one of the three levels:

- a. IVC
- b. Hepatic veins
- c. Small central veins

With Budd-Chiari there are many and varied flow abnormalities such as:

Absent or reversed flow in the hepatic veins and IVC

Decreased flow velocity in the portal vein with probable reversed flow.

13. Intrahepatic fistulas (hepatic artery-portal vein) are symptomatic and characterized by:

Portal vein enlargement

Reversed portal vein

Portal vein with arterialized, highly turbulent flow at the junction between the hepatic artery and portal vein.

14. Intrahepatic fistulas (hepatic vein-portal vein) are less symptomatic and characterized by:

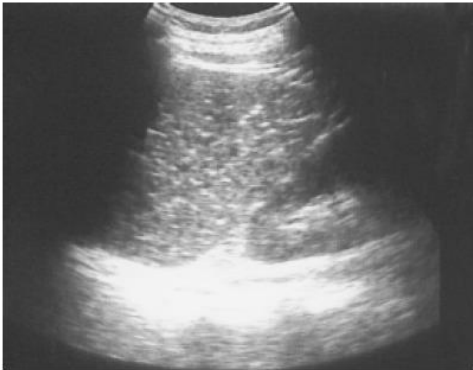
In the parenchyma, they sonographically appear as cystic spaces.

Color flow turbulence is seen with color imaging.

High velocities are recorded at point of communication.

Portal vein signals become pulsatile like the hepatic vein if the channel/ tract is large.

## Spleen Ultrasound pathology



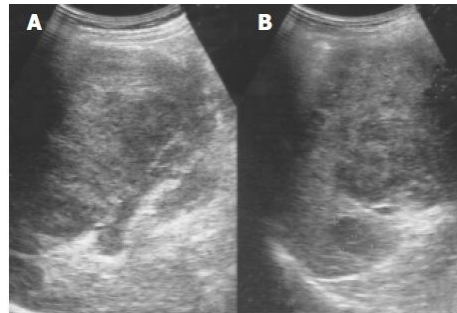
Calcified spots Gamma-Gandy bodies



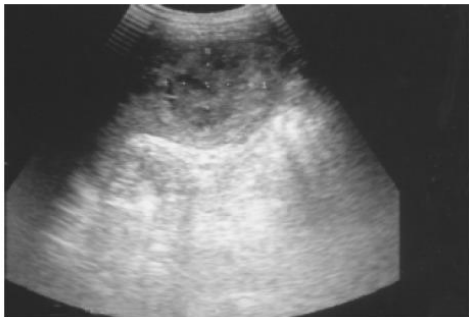
Pseudocyst of the spleen



Pancreatic pseudocyst eroding into spleen, secondary to alcoholic pancreatitis



Lymphoma

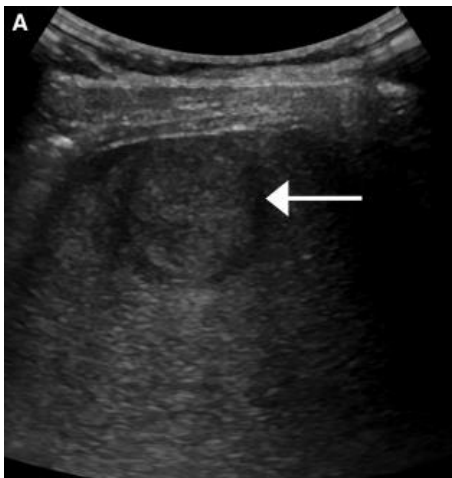


Splenic metastasis from lung carcinoma; hypoechoic mass with target sign

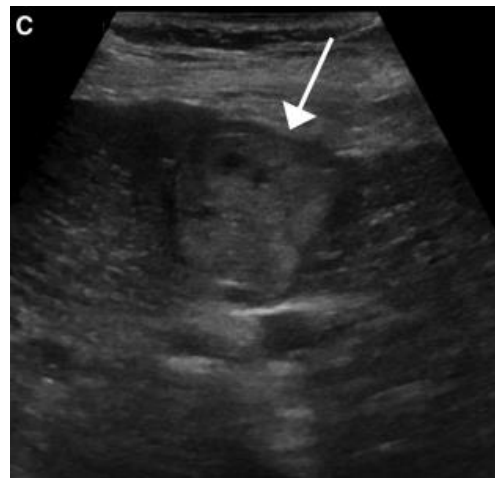
## Common Liver Pathology



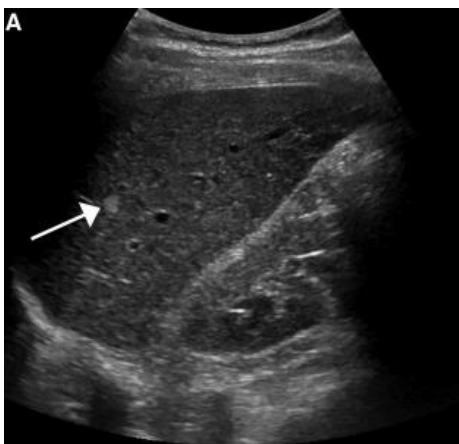
Liver metastases



Hepatic cell carcinoma



Hepatic cell carcinoma



Hepatitis with hemangioma

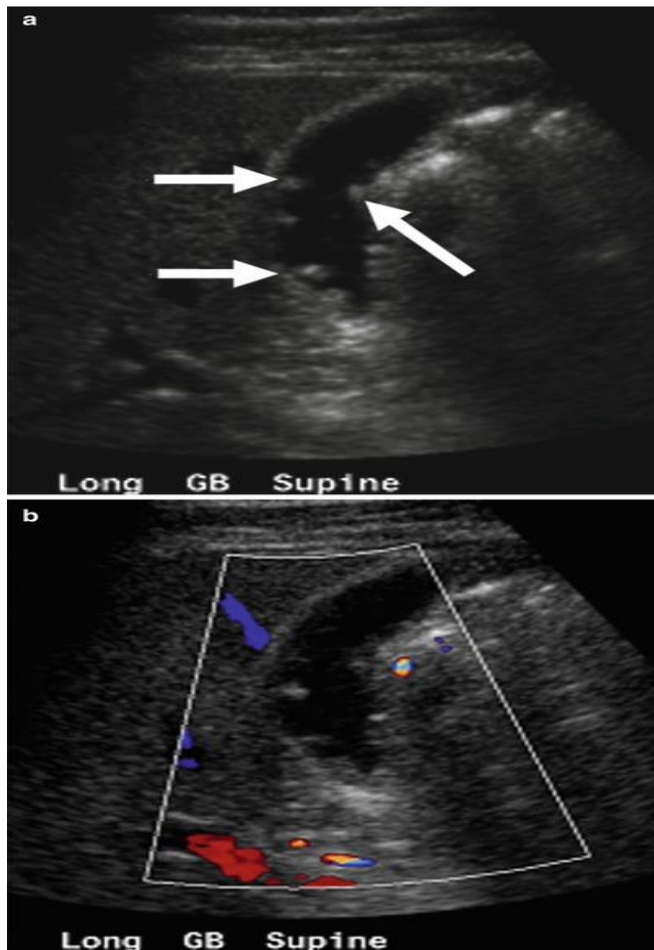




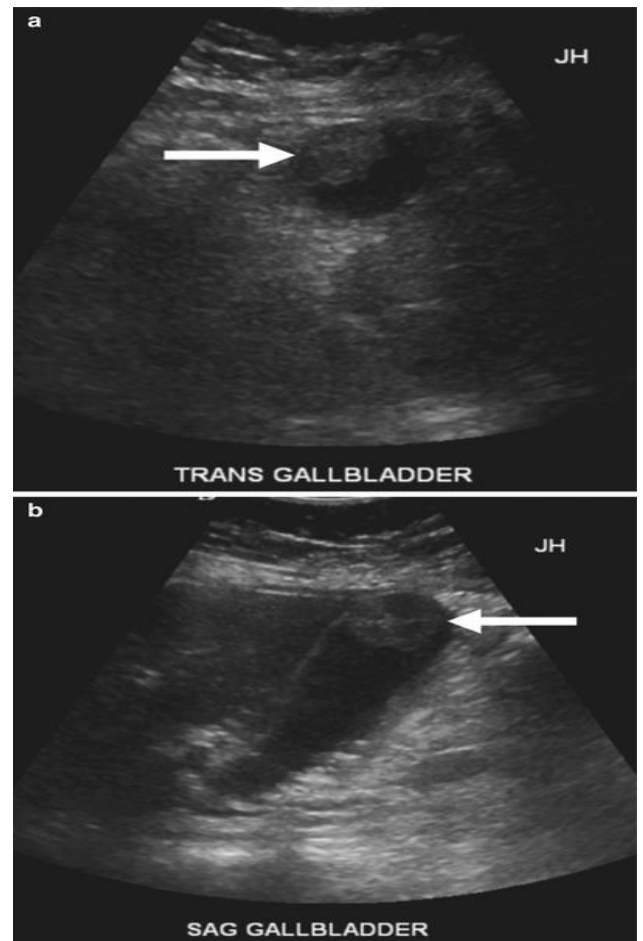
**Fig. 2:** A gallstone resides within the gallbladder lumen. Note the hyperechoic gallstone with posterior shadowing.



**Fig. 3:** A gallbladder with multiple gallstones, a thickened wall and pericholecystic fluid: signs suggestive of cholecystitis.



Gallbladder polyp



Gallbladder adenocarcinoma

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## **Hampton Roads Ultrasound**

### **Procedure: Pelvic screening**

**Revised: 10/22**

#### **Patient prep:**

Drink 32 ounces of fluids

#### **Equipment and supplies needed:**

Duplex system with transducers: curve linear 4c

Ultrasound gel

Towels, bed linen

Disinfectant towelettes

Gloves, probe covers

#### **Protocol:**

1. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study.
2. Patient in supine position and expose the abdomen. Have patient remove undergarment if they consent to the internal exam.
3. Place probe cover over the internal probe. Instruct patient on proper leg positioning. Start examination.

#### **UTERUS LONGITUDINAL**

- a. Images to include uterine cervical distance
- b. AP measurement and longitudinal measurement
- c. Image to include cul-de-sac
- d. Image and measurement of endometrial stripe
- e. Images of both adnexa

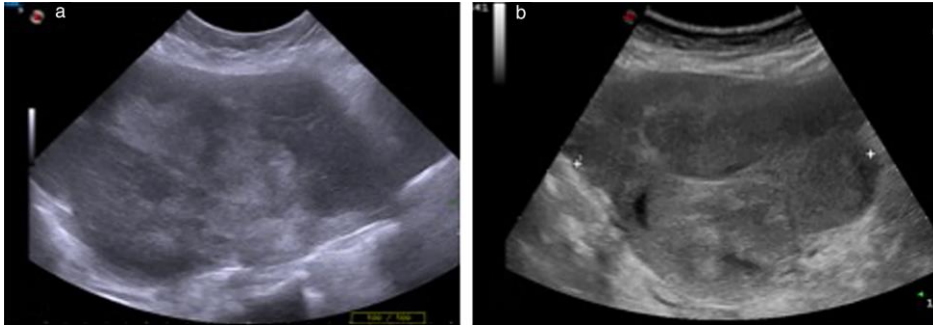
#### **TRANSVERSE**

- f. Transverse measurement of uterus
- g. Transverse images of fundus, body, and cervical regions of the uterus
- h. Transverse image of the vaginal cuff
- i. Images of both adnexa

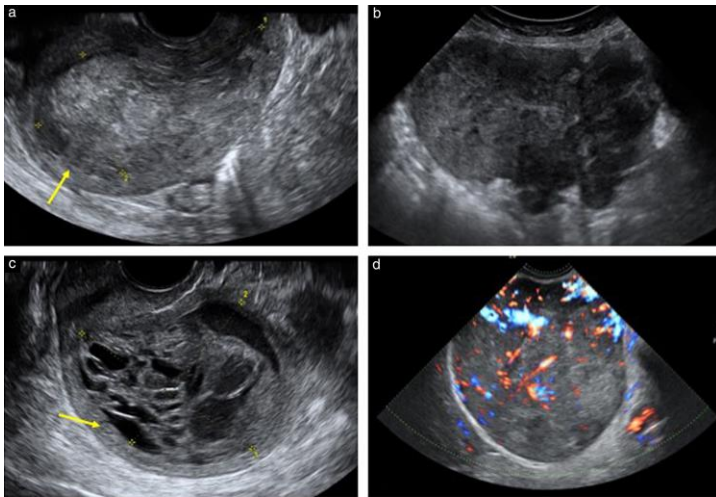
#### **OVARIES**

- j. Longitudinal and transverse images including AP, longitudinal and transverse measurements
- k. Color flow images of the ovaries bilaterally
- l. Doppler waveforms of both ovaries to show blood flow

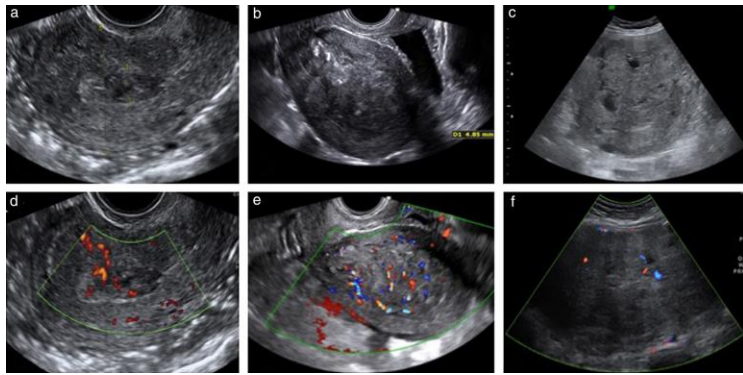
## Common Findings



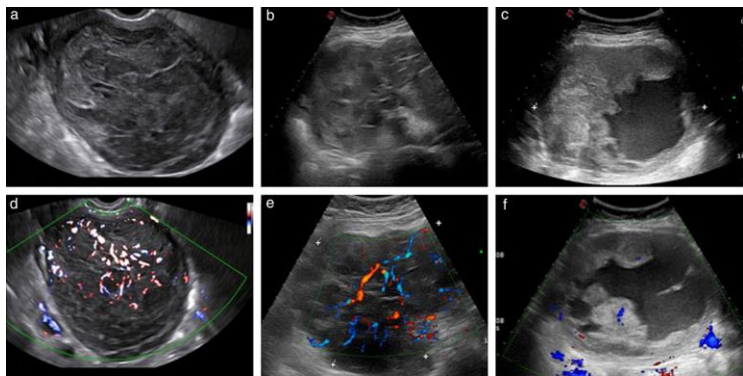
Ultrasound images of leiomyosarcoma (a) and undifferentiated endometrial sarcoma (b), showing 'cooked appearance' of solid tissue, i.e. lack of structure of solid tissue of tumor and absence of shadowing.



Ultrasound images of uterine sarcomas. According to assessment by original examiner, there was normal visible myometrium (yellow arrows) in 149/195 (76.4%) cases (a,c), 151/195 (77.4%) sarcomas manifested inhomogeneous echogenicity of solid tissue (a,b,d), 87/195 (44.6%) contained cystic areas (c), 103/195 (52.8%) had irregular tumor borders (b) and 127/187 (67.9%) manifested moderate or rich vascularization (d).



Grayscale ultrasound images of three endometrial stromal sarcomas (a-c) and corresponding color- or power-Doppler images showing moderate (d,e) and minimal (f) vascularization.



Grayscale ultrasound images of three undifferentiated endometrial sarcomas (a-c) and corresponding color- or power-Doppler images showing rich (d,e) and minimal (f) vascularization.

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# **HAMPTON ROADS ULTRASOUND**

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**Procedure: Testicular screening**

**Revised: 10/22**

**Patient prep:**

- The study must be explained to the patient in detail including the need to expose the scrotum for ultrasound testing.

**Equipment and supplies needed:**

Duplex system with transducers: L-7 or other linear array probe C-4 (or other curved array probe if needed)

Ultrasound gel

Towels, bed linen

Disinfectant spray

Gloves, probe covers

**Patient position:**

Begin with patient in the supine position with the scrotum exposed only. Instruct patient to cover penis with drape.

**Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Ask and record pertinent medical information related to the study (previous history of AAA, dissection, renal tumor, HTN, DM, CAD, PVD, DVT). Document recent cardiovascular surgeries/ procedures (CABG, revascularization, nephrectomy, catheterization, arteriogram, angioplasty with stent, thrombectomy, or biopsy).
4. Document where and when the surgery/ procedure was performed.
5. Ask the patient about previous studies (when, where and results).
6. Inform the patient about the duration of the test. Before starting, ask patient if he/she needs to use the restroom. There are instances when a patient uses the restroom frequently due to medication; therefore, make allowances should he/she needs a break during the study.
7. Instruct patient to expose the scrotum and drape him/ her so that only area of interest is exposed for scanning.
8. Instruct patient to lie down (supine position) on the bed.

Note: The sequence and positioning of the patient in the following protocol may vary according to sonographer's preference.

# SCROTAL ULTRASOUND PROTOCOL

## TRANSVERSE

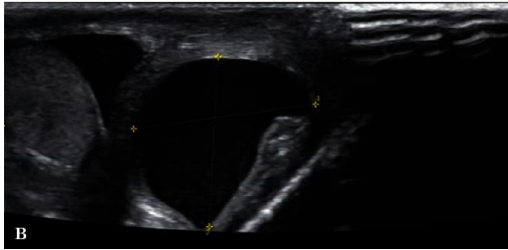
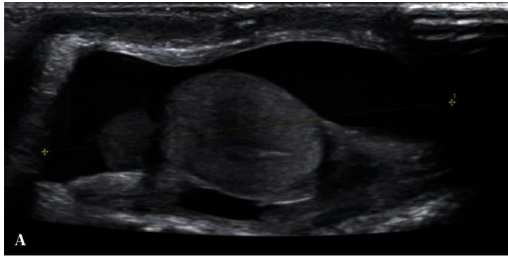
- Image to include both testes
- Images through each testicle labeled upper, mid, and lower poles
- Transverse measurement through the mid pole
- Image of epididymi

## LONGITUDINAL

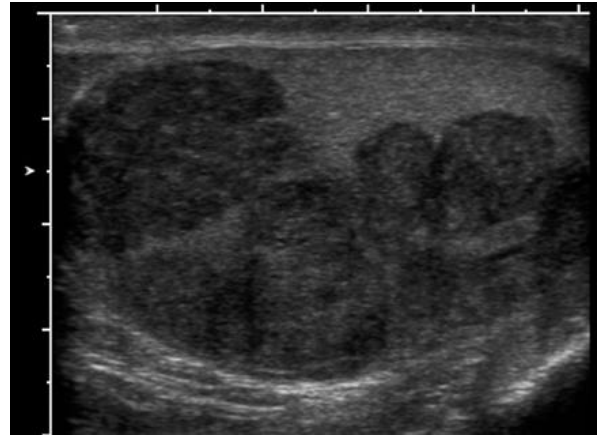
- Images through each testicle
- AP and longitudinal measurements
- Image of epididymi
- Doppler waveforms of each testicle to show arterial and venous flow
- Color flow images of both testicles and epididymi for comparison
- Any pathology should be imaged in at least two planes and measured in AP, transverse and longitudinal dimensions.

9. If the result is **POSITIVE** for significant findings designate the exam as urgent and flag for physician interpretation, results will be called to the participant within 48 hours.
10. Change bed linen and set up the room for the next patient.
11. Wash hands if visibly soiled. Alcohol disinfect hands if not visibly soiled.

## Common Scrotal Pathology



Hydrocele



Seminoma



Lymphoma



## **Hampton Roads Ultrasound**

**Procedure:** Thyroid ultrasound screening

**Date Revised:** 10/22

### **Patient prep:**

The patient must be informed of the nature of the exam. Patient will lay supine on a stretcher with the neck exposed. Remind patient to not wear turtleneck sweater and remove all necklaces or neck jewelry.

### **Equipment and supplies needed:**

Duplex system with transducers: Linear array transducer 7-15 mHz

Ultrasound gel

Towels, bed linen

Disinfectant towelettes

Gloves, probe covers (if needed)

### **Patient position:**

Begin with patient in the supine position with head slightly tilted back.

Patient may have to turn head left and right to obtain adequate views of thyroid.

### **Breathing Technique:**

Normal respiration.

Possible held respiration.

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### **Protocol:**

1. Wash hands.
2. Check physician order (written order).
3. Introduce oneself to the patient and explain the procedure. Confirm patient identity. Ask and record pertinent medical information related to the study (previous history of AAA, dissection, HTN, DM, CAD, PVD, DVT).  
Document recent thyroid surgeries/ procedures or previous exams (abnormal or normal)
4. Document where and when the surgery/ procedure was performed.
5. Ask the patient about previous studies (when, where and results).
6. Inform the patient about the duration of the test. Before starting, ask patient if he/she needs to use the restroom. There are instances when a patient uses the restroom frequently due to medication; therefore, make allowances should he/she needs a break during the study.
7. Instruct patient to expose the neck and drape him/her so that only area of interest is exposed for scanning.
8. Instruct patient to lie down (supine position) on the bed.

Note: Different patient positions and breathing techniques should be utilized to obtain desired results.

## TRANSVERSE

- Image through the isthmus
- Images through superior, mid, and lower poles of both lobes (label)
- Transverse measurement of mid lobe
- Measure AP thickness of isthmus

## LONGITUDINAL

- Images are obtained through right and left lobe
- AP and Longitudinal measurement

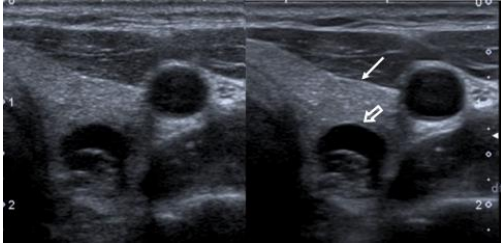
NOTE: Thyroid abnormalities should be imaged and measured in AP, Transverse, and Longitudinal dimensions include color flow assessment.

9. Wipe off the gel from the patient's skin. Wipe off the gel from the transducer(s) followed by disinfectant spray/wipes.
10. Assist patient to sitting position. Instruct patient to sit up quietly and observe any unsteadiness, dizziness. Ask if he/she needs assistance.
11. If the result is negative for significant findings inform the patient that the official report will be sent to him/her within three business days and discharge the patient.
12. If the result is **POSITIVE** for significant findings designate the exam as urgent and flag for physician interpretation, results will be called to the participant within 48 hours.
13. Change bed linen and set up the room for the next patient.
14. Wash hands if visibly soiled. Alcohol disinfect hands if not visibly soiled.

## Tips and Pitfalls

1. In large patients, use the low frequency transducer for broad view of the thyroid tissue.
2. Have patient attempt to hold breath if there is significant motion artifact.

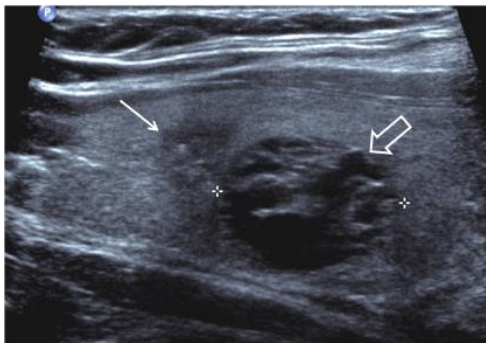
### INTERPRETATION GUIDELINES:



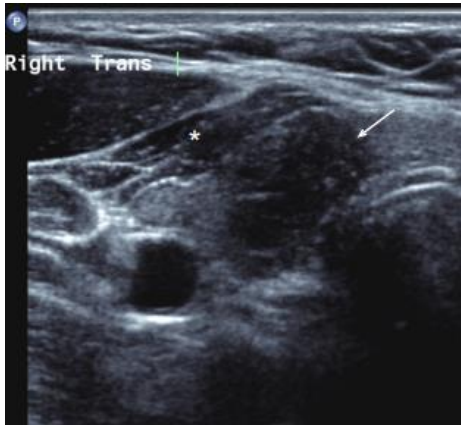
Transverse images of a predominantly cystic left lobe nodule obtained without (left) and with (right) spatial and frequency compounding software. Note the improved delineation of the thyroid (arrow) and cystic nodule (block arrow) margins



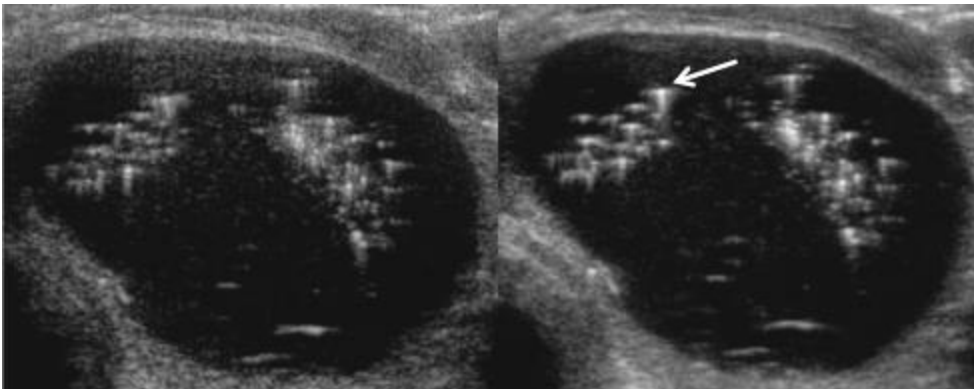
Longitudinal image of a hypoechoic nodule with a spiculated margin (arrows) and anterior capsular breach on high-resolution ultrasound. The lesion was confirmed as a papillary thyroid carcinoma on surgical resection



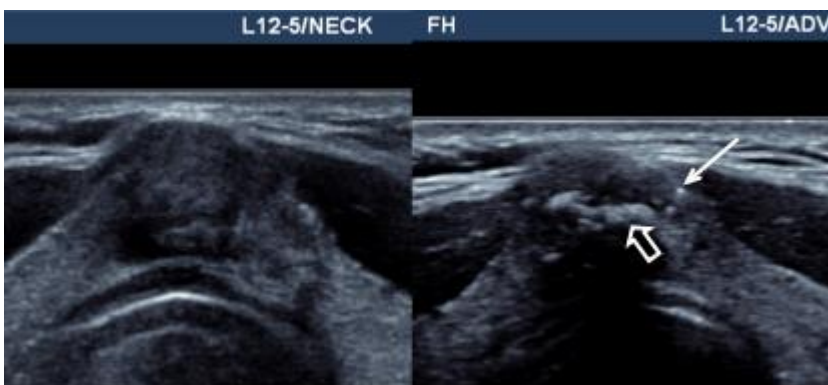
Longitudinal image of a 1.5-cm nodule (block arrow) detected incidentally on cervical spine MRI. This nodule is spongiform and appears confidently benign. However, a 0.6-cm ill-defined nodule alongside (arrow) is hypoechoic and contains microcalcification— FNA was performed from this nodule and confirmed papillary thyroid carcinoma



Transverse image of the right thyroid lobe showing a nodule (arrow) of slightly lower reflectivity than the adjacent strap muscle (\*), i.e., 'markedly hypoechoic'. A pT1b infiltrative, classical papillary thyroid carcinoma was found on surgical resection



A cystic nodule without (left) and with (right) signal processing software active. Note the increased conspicuity of the comet tail artefact (arrow) on the active image. Images courtesy of Dr S.T. Elliott



Transverse images of a 1-cm thyroid isthmus nodule using standard thyroid ultrasound (left) and modified grey-scale map/dynamic range presets (right). Macro- (block arrow) and microcalcifications (arrow) are much more conspicuous with the modified preset, originally designed to detect calcification in breast lesions. A follicular variant papillary thyroid carcinoma containing dystrophic and psammomatoid calcification was confirmed on resection

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