Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

465 Henry Mall
Madison, WI 53706-1578
Phone: (608) 262-0402
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UW Cytogenetics and Molecular Genetics Laboratory

Postmortem Genetic Testing (Next Gen PM)

Why do Postmortem genetic testing?

A sudden unexplained death in an infant, child, or young adult (≤45 years) are often assumed to be cardiac related and many are caused by underlying genetic conditions. Autopsies are an important component to uncovering the cause of death, but up to 30% of the time no abnormalities are found in the heart. Postmortem genetic testing can provide another opportunity to identify or confirm the cause of death. Especially when sudden cardiac death occurs in the young, genetic testing may identify inherited cardiac disease in 25-30% of individuals. This provides family an opportunity for closure, but also allows other blood relative to be tested for the identified, and often treatable, genetic condition. Once identified, these at risk family members can gain access to appropriate screening and surveillance measures.

What is Next Gen PM?

Next Gen PM is a test that is performed on a blood or tissue sample after an individual has died. The goal of postmortem genetic testing is to try to identify the cause of death and identify if blood relatives are at-risk for a genetic disease or sudden death.

The UW Cytogenetic and Molecular Genetic Laboratory offers Next Gen PM for certain cases of sudden death, including suspected sudden cardiac death. This is done using whole exome sequencing (WES) and is free to those who qualify.

Does my family qualify for Next Gen PM?

☐ Was the decedent 45 years old or younger?

☐ Did/does the decedent and their family live in Wisconsin?

☐ Was the autopsy negative (meaning no cause of death was identified)?

If all of the above are correct, then the family may qualify for Next Gen PM. To learn more, please call our laboratory genetic counselor at 608-262-0402.

Clinical Sudden Unexplained Death in the Young (SUDY) exome testing (SLH test code 895M68) is also available to those who do not qualify for Next Gen PM. Test information is available on our website: http://www.slh.wisc.edu/clinical/cytogenetics/. For pricing, please call our laboratory at 608-262-0402.

For more information regarding postmortem genetic testing FAQs please visit: http://www.nsgc.org/postmortem

Deignan et al. Points to consider in the practice of postmortem genetic testing: A statement of the American College of Medical Genetics and Genomics (ACMG). Genet Med. 2023 PMID: 36799919

Ackerman MJ, et al. HRS/EHRA Expert Consensus Statement on the Sate of Genetic Testing for the Channelopathies and Cardiomyopathies. Heart Rhythm 2011 PMID: 21787999

Middleton O, et al. National Association of Medical Examiners Position Paper: Retaining Postmortem Samples for Genetic Testing. Acad Forensic Pathol 2013 3(2):191-194

Tan, et al. Sudden unexplained death: Heritability and diagnostic yield of cardiological and genetic examination in surviving relatives. Circulation. 2005 PMID: 15998675

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Next Gen PM Consent

The purpose of this test is to find any changes (variants) in your family member's (the decedent's) DNA that may have contributed to their sudden death. The decision to have this testing should be made by the decedent's family and their healthcare provider.

Testing

1. DNA is the molecule that makes up our genes.
2. DNA taken from your family member (the decedent) will be tested (sequenced) to look for changes (variants) in the DNA that could explain the sudden, unexpected death in your family member (the decedent).
3. This test will not find all changes in the DNA. Not all areas of the DNA will be tested. This test will sequence most of the areas that contain our genes, but not all. Some types of changes (large rearrangements, copy number variation (CNV), trinucleotide repeat expansions, epigenetic effects) may not be found.
4. Many gene changes are expected to be found in the DNA sequence. Some changes are normal and do not cause health problems. Only changes the may explain the sudden, unexpected death in your family member will be reported.
5. Test results will be reported to your doctor and/or genetic counselor assisting you with this testing.

Results

1. The results of this testing will be reported to your doctor and/or genetic counselor.
2. Possible reported test results include:
    a. Pathogenic or likely pathogenic variant detected. This means a change (variant) was found that could explain the sudden, unexpected death in your family member (the decedent).
    b. No known pathogenic or likely pathogenic variants detected. This means a change (variant) that could explain the sudden, unexpected death in your family member (the decedent) was not found. This result does not mean that the death in your family member did not have a genetic cause. But, it does mean a genetic cause was not found at this time.
3. Not all DNA changes (variants) will be reported. DNA changes (variants) that will not be reported include:
    a. Variants commonly seen in healthy people (benign variants)
    b. Variants that might slightly increase the risk for common disease (ex. diabetes, asthma, high blood pressure)
    c. Variants in genes not known to be associated with sudden, unexpected death
    d. Variants with uncertain clinical significance
    e. Variants in the mitochondrial DNA

Implications

1. This testing may identify a change (variant) in your family member's (the decedent's) DNA that has health implications for other blood relatives.
2. If your family member (the decedent) is found to have a medically significant (pathogenic or likely pathogenic) DNA change, their blood relatives (i.e. mother, father, siblings, children, etc.) may also carry that change.
    a. As part of this testing, the UW Cytogenetics and Molecular Genetics Laboratory will test first-degree relatives of the decedent for the medically significant (pathogenic or likely pathogenic) DNA change. This testing will be free of charge.
3. Genetic testing may cause emotional stress. Some people may feel anxious or depressed after learning genetic information about themselves and/or their family.
4. Genetic counseling is recommended to discuss these results and the sudden, unexpected death in your family member.

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Next Gen PM Testing Authorization and Consent

Please complete this page in its entirety

Specimen Demographics

Deceased's Name (Last, First)	
Date of Birth	
Date of Death	
Sex	

☐ I have read the Next Gen PM consent document and I authorize Next Gen PM testing on a sample of DNA from the decedent (name and demographics above), by the UW Cytogenetic and Molecular Genetics Laboratory, and understand the implications of the DNA testing to be completed. ***(Required)***

☐ I authorize the laboratory to amend and reissue the test report in the future if new information about gene-disease associations and variant significance changes. *(Optional)*

☐ I authorize the laboratory or clinical staff to contact me in the future to discuss possible participation in research studies. *(Optional)*

☐ I authorize banking of residual DNA for future diagnostic testing or research studies authorized by me or the current Specimen Owner (policy below). *(Optional)*

Family Consent by Authorized Specimen Owner

Name (Last, First)	
Mailing Address	
Relationship to decedent	
Signature and Date	

Ordering clinician

By signing below you affirm you have explained the DNA testing to be completed to the owner of the DNA sample and have answered all this individual's questions.

Provider Name	
Healthcare Institution	
Mailing Address	
Fax	
Signature and Date	

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Next Gen PM DNA Banking Policy

The purpose of this DNA Bank is to isolate and store purified human DNA for future diagnostic testing and store DNA for future diagnostic testing or research studies authorized by the Specimen Owner.

1. This Bank will adhere to the guidelines proposed by the American Society of Human Genetics (Am. J. Hum. Gen. 42:781 (1988)) and the current recommendations of the American College of Medical Genetics Storage of Genetic Materials Committee.
2. Because of the complexity and implications of DNA banking, blood samples will be processed and stored only after receiving a complete informed consent for DNA banking form signed by both the depositor and his/her healthcare provider, knowledgeable in the area of human genetics.
3. DNA will be extracted from a minimum of 3 ml sample of blood. The amount of purified DNA recovered and the integrity of the sample will be ascertained prior to storage, and successful storage will be reported to the depositor.
4. A very small percentage of blood samples from which the DNA is to be extracted may be lost in shipping or inadvertently destroyed. This Bank and the University of Wisconsin are not responsible for such loss.
5. In the event that no DNA is obtained from the specimen submitted, the depositor will be notified immediately and requested to provide an additional specimen at no additional charge for processing and storage of the sample.
6. The DNA sample will be divided and stored at in two separate locations equipped with temperature control alarms. The samples shall then be stored indefinitely, except as further described in this policy.
7. It is the responsibility of the depositor or sample owner to inform the DNA Bank of address changes or if they choose to have their sample removed from the bank and destroyed.
8. Banked DNA is the property of the depositor, the person from whom the sample was taken, or their designee. In the event the DNA is obtained from a child, the sample is in control of the legal guardian until which time the depositor is no longer a minor under current law. In the event the depositor dies before transferring ownership to another individual, the sample will be destroyed. Ownership can be transferred to another individual at any time by writing to this laboratory.
9. Release for clinical testing of any portion of the DNA deposited requires the written request and authorization of the depositor, specifying the testing facility or medical professional and address where the specimen(s) will be analyzed (any paperwork needing to be sent with the sample should be included with your request.) The University of Wisconsin Cytogenetics Laboratory DNA Bank will not be held responsible for diagnostic testing of these specimens in other facilities. The DNA will be released only to the designated medical professionals or diagnostic laboratories. Because of the complexity and implications of DNA testing, the DNA sample will be released for testing only through a physician or genetic counselor designated by the depositor.
10. The DNA Bank will obtain written informed consent of the depositor or subsequent owner of the DNA before using any part of the sample for research unless such consent is not required by law. The DNA Bank retains the right to contact the depositor regarding permission for this use.
11. The bank reserves the right to destroy a sample at any time after making reasonable attempts without success to contact the depositor using the last known address or if the Bank determines that the sample is not the depositor's.
12. The depositor may request to have the sample destroyed or transferred to another medical laboratory at any time. Written directions from the depositor are required. No refund of any part of the processing and storage fee will be made in the event the sample is destroyed or transferred.
13. The DNA sample and all information received shall be held in strict confidence.
14. The depositor may contact the DNA Bank at any time. Current contact phone: 608-262-0402.