Frequently Asked Questions

Does Medicare cover the expanded ActX test?

Medicare currently covers expanded pharmacogenomics testing in three Medicare regions: Noridian, Palmetto, and CGS. During the patient authorization for testing process, there is a drop-down menu with testing options. For expanded Medicare coverage, if the patient's medication and clinical status are appropriate, choose the "Pharmacogenomics 65" option during authorization. The patient's out of pocket contribution will not exceed $200 regardless of what Medicare pays. After Medicare is billed, there will be an option for the patient to expand to the full ActX Service for a small fee.

What medication/gene pairs are billed to Medicare?

Expanded Medicare coverage covers all CPIC A/B recommendations, and FDA labeling for drug-genomic interactions. This currently translates to over 110 different medications, covered by the ActX test. In addition to the selected medication, the physician must carefully consider non-genetic factors and decide that genetic testing will truly make a difference for clinical medication selection. The full list of medications in our Medicare expanded package (Pharmacogenomics 65) is available at the bottom of this document. For full details on Medicare's expanded genomics coverage click here.

Who are good candidates for this test?

Any patient where you are prescribing or considering the prescription of a covered medication, and in which genetics would make a difference in clinical medication selection, are good candidates for the test. Also keep in mind that if ActX is integrated into your EHR, the patient will benefit from pre-emptive drug genomic interaction checking moving forward.

Important therapeutic areas where Medicare will cover genetic testing if clinically indicated, for drug-genomic interactions include:

- Analgesics
- Cardiovascular agents
- Anti-coagulants
- Anti-infectives
- Neurological agents
- Anti-depressants
- Oncology agents
- Rheumatology agents
- Transplantation medications

See Appendix A for a complete list of therapeutic areas and relevant medications.

How much patient information is needed to authorize a patient?

If you use ActX inside an integrated Electronic Health Record, you will need to provide the patient's email address when you place the order. If you use the ActX web site to order testing, you will need to provide:

- The patient's first name
- Last name
- Date of birth
- Gender
- Patient's email address
- Related ICD-10 diagnosis code
- Name of the drug with a genomic concern
- Intended use for the drug – Medicare requires an explanation of why this patient has a reasonable and necessary need to be tested in order to cover the cost
- And (optionally) the medical record number.

How accurate is the test?

ActX emphasizes the reduction of false positives. The genotyping process is on average 99% specific for the variants involved in drug-genomic interactions. For the variants that we check for, our false negative rate is 2.5% or less, usually less than 1%. It is important to note that our genotyping process does not check for all possible variants, so the actual false negative rate can be significantly higher. For HLA calls, specificity is somewhat lower.

How will I be notified of results?

If you use ActX inside an integrated Electronic Health Record, you will be notified of your patient's results availability within your EHR. If you use the ActX web site, you will be notified that a patient's results are available via email. As an authorizing physician, you will receive a notification 5 to 7 days before your patient does.

How is the sample obtained?

After authorization by a physician, the patient receives an email with a link allowing them to sign up for the ActX service. On the registration page, the patient will be consented, provide demographic information, and provide a form of payment for the co-pay. The patient will receive a saliva collection kit at their home, and spit one or two cc into a tube. The kit is then mailed directly using a self-mailer to our CLIA certified laboratory, where it is genotyped. The genetic data will then be securely uploaded for analysis and storage.

How long does it take to get results back?

Results will be available in four to six weeks after a sample is sent to us. In some cases samples must be re-run if the initial sample fails Quality Assurance, which will delay the results.

How is the patient notified of results?

Patients are notified that their results are available via email approximately a week after the authorizing physician receives the results. They can then sign into their account on ActX.com to view their results.

How secure is patient data?

All data is encrypted end to end, with sophisticated authentication and audit procedures. Patient privacy is a primary goal, and the technology is designed to be HIPAA compliant.

Appendix A - Full list of Medicare-approved pharmacogenomic medications ordered by therapeutic group:

ANALGESICS
Codeine
Tramadol

ANESTHESTICS, INHALED
Desflurane
Enflurane
Isoflurane
Sevoflurane

ANESTHETICS, NEUROMUSCULAR BLOCKERS
Succinylcholine
Tetracaine (G6PD)

CARDIOVASCULAR AGENTS (ANTIARRHYTHMICS, ANTIPLATELETS, BETA-BLOCKERS, DIURETICS, HEMATOLOGICS, VASOPRESSORS) (ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITORS)
Carvedilol
Clopidogrel
Hydralazine
Metoprolol
Propafenone
Quinidine
Simvastatin

ENDOCRINOLOGY (ANTIDIABETICS)
Glimepiride (G6PD)
Glipizide (G6PD)
Tolazamide (G6PD)
Tolbutamide – CYP2C9, CYP2C9

GASTROINTESTINAL AGENTS (ANTICHOLINERGICS, ANTIEMTICS, MESALAMINE, PROTON PUMP INHIBITORS)
Dexlansoprazole
Dronabinol
Fesoterodine
Lansoprazole
Meclizine

Metoclopramide
Omeprazole
Ondansetron
Pantoprazole
Tolterodine

ESTROGENS
Estradiol / progesterone
Ethinyl estradiol / drospirenone

HEMATOLOGY
Avatrombopag
Eltrombopag
Warfarin

ANTI-INFECTIVE AGENTS
Abacavir
Ceftriaxone – G6PD
Dapsone (G6PD)
Efavirenz (Long QT), CYP2B6
Hydroxychloroquine (G6PD)
Isoniazid
Mafenide (G6PD)
Nitrofuantoin (G6PD)
Primaquine
Quinine (G6PD)
Sulfadiazine (G6PD)
Sulfamethoxazole / trimethoprim
Sulfasalazine (G6PD)
Voriconazole

NEUROLOGY (ANTICONVULSANTS, ANTI-PARKINSON AGENTS, CHOREA and TARDIVE DYSKINESIA, MULTIPLE SCLEROSIS, ALZHEIMERS, ERECTILE DYSFUNCTION)
Amifampridine
Carbamazepine –HLA-B, HLA-A
Clobazam – CYP2C19 PM
Deutetrabenazine – CYP2D6
Divalproex sodium – UCD + POLG
Fosphenytoin – HLA-A + CYP2C9
Lamotrigine – HLA-B
Oxcarbazepine – HLA-B
Phenytoin – HLA-A + CYP2C9

Siponimod – CYP2C9
Tetrabenazine – CYP2D6 PM
Valbenazine – CYP2D6
Valproic acid – UCD + POLG

ONCOLOGY (ANTINEOPLASTIC AGENTS, IMMUNOSUPPRESSANTS)

Azathioprine
Capecitabine
Cisplatin
Dabrafinib
Erdafitinib
Fluorouracil
Gefitinib
Lapatinib
Mercaptopurine
Pazopanib – HLA-B
Rasburicase (G6PD)
Tamoxifen
Thioguanine

PSYCHIATRY (ANTIDEPRESSANTS, ANTIPSYCHOTICS, ANTIMANIC AGENTS, STIMULANTS

Amitriptyline – CYP2D6 + CYP2C19
Aripiprazole – CYP2D6 PM
Atomoxetine – CYP2D6
Brexpiprazole – CYP2D6 PM
Brivaracetam – CYP2C19
Citalopram – CYP2C19
Clomipramine – CYP2D6 + CYP2C19
Desipramine – CYP2D6 + CYP2C19
Doxepin – CYP2D6 + CYP2C19
Escitalopram – CYP2C19 PM + UM
Fluvoxamine – CYP2D6 PM
Haloperidol – CYP2D6 PM + UM
Iloperidone – CYP2D6
Imipramine – CYP2D6 + CYP2C19
Nortriptyline – CYP2D6 + CYP2C19
Paroxetine – CYP2D6 PM + UM
Pimozide – CYP2D6 PM
Protriptyline – CYP2D6 + CYP2C19
Sertraline – CYP2C19 PM + UM
Thioridazine – CYP2D6
Trimipramine – CYP2D6 + CYP2C19

Venlafaxine – CYP2D6 PM + IM + UM
Vortioxetine – CYP2D6 PM

RHEMATOLOGY (AGENTS FOR GOUT, SKELETAL MUSCLE RELAXANTS, NONSTEROIDAL ANTI-INFLAMMATORY AGENTS
Allopurinol
Carisoprodol
Celecoxib
Flurbiprofen – CYP2C9
Ibuprofen – CYP2C9
Lesinurad – CYP2C9
Meloxicam – CYP2C9
Pegloticase (G6PD)
Piroxicam – CYP2C9
Probenecid (G6PD)

TRANSPLANTATION (see IMMUNOSUPRESSANTS)
Mycophenolate mofetil – HPRT1
Mycophenolate sodium – HPRT1
Tacrolimus – CYP3A5

MISCELLANEOUS (GAUCHER DISEASE ENZYME INHIBITOR, HYPOACTIVE SEXUAL DESIRE DISORDER, ANTIDOTES)
Eliglustat – CYP2D6
Flibanserin – CYP2C19
Methylene blue (G6PD)
Oxymetazoline (G6PD)

Appendix B - Alphabetical list of Medicare-approved pharmacogenomic medications:

* = included in FDA TABLE OF BIOMARKERS IN DRUG LABELS
# = included in current CPIC guidelines

* Abacavir – HLA-B*5701
Allopurinol – HLA-B
* Amitriptyline
* Aripiprazole – CYP2D6 PM
# * Atomoxetine – CYP2D6
*Avatrombopag – F5, SERPINC1, F2, PROC, PROS1
* Azathioprine – TPMT, NUDT15
* Brexpiprazole – CYP2D6 PM
* Brivaracetam – CYP2C19 PM
# * Capecitabine - DPYD
# * Carbamazepine – A = HLA-B*1502 per CPIC, B = HLA-A*3101
* Carisoprodol – CYP2C19 PM
* Carvedilol – CYP2D6 PM
* Ceftriaxone – G6PD possible
# * Celecoxib – CYP2C9 PM
*Cisplatin – TMPT
Citalopram – CYP2C19
*Clobazam – CYP2C19 PM
Clomipramine – CYP2C19, CYP2D6
* Clopidogrel – CYP2C19 [A-PM, B-IM] [+ ABCB1 per expert group]
* Codeine – CYP2D6
* Dabrafenib – G6PD possible
*Dapsone – G6PD unsafe
*Desflurane – CACNA1A, RYR1
* Desipramine – CYP2D6
*Deutetrabenazine – CYP2D6 PM
* Dexlansoprazole – CYP2C19
* Divalproex sodium – UCD, POLG
# * Doxepin – CYP2C19, CYP2D6
*Dronabinol – CYP2C9 PM
* Efavirenz – CYP2B6 PM
*Eliglustat – CYP2D6 [A-PM, B-UM]
* Eltrombopag – F5 Ho & He, SERPINC1
# * Enflurane – CACNA1A, RYR1
* Escitalopram – CYP2C19 [A-PM, B-UM]

* Estradiol / progesterone - F5 Ho & He, -F2 Ho & He, PROC
*Ethinyl Estradiol / drospirenone - F5 Ho & He, F2 Ho & He, PROC
*Flibanserin – CYP2C19 PM
* Fluorouracil – DPYD [A-deficiency Ho or He, B-He]
* Flurbiprofen – CYP2C9
* Fluvoxamine – CYP2D6 PM
*Fosphenytoin cerebyx
*Gefitinib – CYP2D6 PM
* Glimeperide – G6PD possible
* Glipizide – G6PD possible
* Hydralazine – NAT2 [A-slow acetylator & B-rapid acetylator]
* Hydroxychloroquine – G6PD possible
# Ibuprofen – CYP2C9
*Iloperidone – CYP2D6 [PM]
* Imipramine – CYP2C19, CYP2D6
* Isoflurane – TPMT, NUDT15
* Isoniazid – NAT2, G6PD possible
# * Lansoprazole – CYP2C19 [A-UM, B-RM]
*Lapatinib – HLA-DRB1*07:01 & HLA-DQA1*02:01
*Lesinurad – CYP2C9 PM
* Mafenide – G6PD possible
* Meclizine – CYP2D6
# * Meloxicam – CYP2C9
# * Mercaptopurine – TMPT [A-Ho or Cpd He, B-He], NUDT15
*Methylene blue – G6PD unsafe
* Metoclopramide – CYP2D6 PM
* Metoprolol – CYP2D6 [A-PM, B-IM, C-UM]
* Mycophenolate Mofetil – HPRT1 [Ho & Cpd He female]
* Mycophenolate Sodium – HPRT1 [Ho & Cpd He female]
* Nitrofuantoin – G6PD unsafe
# * Nortriptyline – CYP2D6
# * Omeprazole – CYP2C19 [A-UM, B-RM]
# * Ondansetron – CYP2D6 [UM]
# * Oxcarbazepine – HLA-B*15:02
* Oxymetazoline – G6PD possible
# * Pantoprazole – CYP2C19 [A-UM, B-RM]
# * Paroxetine – CYP2D6 [A-PM & B-UM]
* Pazopanib – HLA-B*57:01
* Pegloticase – G6PD unsafe
# * Phenytoin – [A-HLA-B*1502, B-CYP2C9 PM, C-CYP2C9 IM]
* Pimozide – CYP2D6 [PM]
# * Piroxicam – CYP2C9 [PM]

* Primaquine – CYB5R He & Ho, G6PD unsafe
* Probenecid – G6PD possible
* Propafenone – CYP2D6 [PM]
* Protriptyline - CYP2D6
* Quinidine – G6PD possible
* Quinine – G6PD possible
# * Rasburicase – G6PD unsafe
# Sertraline – CYP2C19 [A-PM & B-UM]
# * Sevoflurane – CACNA1S, RYR1
* Siponimod – CYP2C9
# Simvastatin – SLC01B1 [A-Ho & B-He]
* Succimer – G6PD possible
# * Succinylcholine – BCHE Ho or Cpd He, He, He or Ho K variant
* Sulfadiazine – G6PD unsafe
* Sulfamethoxazole-Trimethoprim – G6PD unsafe
* Sulfasalazine – G6PD possible
# Tacrolimus – CYP3A5
# * Tamoxifen – CYP2D6 [PM, IM]
* Tetrabenazine – CYP2D6 [PM]
* Tetracaine – G6PD possible
# * Thioguanine – TMPT [A-Ho or Cpd He, B-He], NUDT15
* Thioridazine – CYP2D6 [PM]
* Tolazamide – G6PD possible
* Tolbutamide – CYP2C9 [A-PM & B-IM]
* Tolterodine – CYP2D6 [PM]
* Tramadol – CYP2D6 [A-UM & B-PM]
# * Trimipramine – CYP2C19/ CYP2D6
* Valbenazine – CYP2D6 PM
* Valproic acid – UCD, POLG
* Venlafaxine – CYP2D6 [A-PM, B-IM, C-UM]
# * Voriconazole – CYP2C19 [A-PM, B-IM, C-UM, D-RM]
* Vortioxetine – CYP2D6 [PM]
# * Warfarin – VKORC1 + CYP2C9 + CYP4F2 + rs12777823