For Emergency Use Authorization only
For prescription use only
For in vitro diagnostic use only

COVCLEAR SARS-COV-2 RAPID ANTIGEN TEST

INTENDED USE

The CovClear™ COVID-19 Antigen Test is a lateral flow immunochromatographic assay intended for the qualitative detection of the nucleocapsid protein antigen from SARS-CoV-2 in nasal swab specimens directly collected. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet the requirements to perform high complexity tests, and at the Point of Care (POC), i.e., in patient care settings operating under a high complexity CLIA Certificate.

Results are for the identification of the SARS-CoV-2 nucleocapsid protein antigen. The antigen is generally detectable in nasal swab specimens during the acute phase of infection. Positive results indicate the presence of viral antigens, but the clinical correlation with patient history and other diagnostic information is necessary to determine infection status. Positive results do not rule out a bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities.

Negative results are presumptive and confirmation with a molecular assay, if necessary, for patient management may be performed. Negative results do not rule out SARS-CoV-2 infection and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Negative results should be considered in the context of a patient's recent exposures, history and the presence of clinical signs and symptoms consistent with COVID-19.

The CovClear™ COVID-19 Antigen Test is intended for use by medical professionals or trained operators who are proficient in performing tests and trained clinical laboratory personnel or individuals trained in Point of Care settings. The CovClear™ COVID-19 Antigen Test is only for use under the Food and Drug Administration's Emergency Use Authorization (EUA).

PRINCIPLES OF THE TEST

The CovClear™ COVID-19 Antigen Test is a lateral flow immunochromatographic assay for the detection of extracted nucleocapsid protein antigens specific to SARS-CoV-2 in nasal swab specimens directly collected.

The CovClear™ COVID-19 Antigen Test is comprised of four components: polyester swab, lateral flow dipstick, polypropylene vials, and extraction buffer solution. Each dipstick contains a nitrocellulose membrane coated with antibodies against the COVID-19 nucleocapsid protein at the test line. A green-colored line will appear at the test line in the presence of the COVID-19 nucleocapsid protein. The nitrocellulose membrane is also coated with a printed control line that will appear as a 'blue' line until the dipstick has been exposed to the swab sample where it will then appear 'red.' This color change from 'blue' to 'red' will indicate that the test was run successfully.

Nasal swabs require a sample preparation step in which the sample is eluted from the swab and into the extraction buffer solution. The CovClear™ COVID-19 Antigen Test dipstick is then placed into the extraction buffer solution. When the swab sample migrates into the test strip the gold nanoparticles labeled with anti-SARS-CoV-2 antibodies will bind the COVID-19 viral antigens to form an antibody-antigen immune complex. The immune complex is then captured by the test line on the nitrocellulose membrane as it migrates through the strip.

Test results are interpreted between 3 and 20 minutes. The presence of two-colored lines, red at the control line and green at the test line, indicates a COVID-19 positive sample. The presence of one red colored line indicates a COVID-19 negative sample. A blue colored line or no line at all 20 minutes after running the assay indicates an invalid test.

WARNINGS AND PRECAUTIONS

- For prescription and in vitro diagnostic use only.
- The test has been validated but the FDA's independent review of this validation is pending.
- This test is for use by laboratories certified under the CLIA that meet the requirements to perform high complexity tests. This test is authorized for use at the Point of Care (POC), i.e., in patient care settings operating under a high complexity CLIA Certificate.
- This test is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostic tests for detection and/or diagnosis of COVID- 19 under Section 564(b)(1) of the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.
- This test has been authorized only for the detection of proteins from SARS-CoV-2, not for any other viruses or pathogens.
- As with all diagnostic tests, all results must be interpreted together with other clinical information available to the physician.
- Immediately use after removing the test strip from desiccated travel container.
- In order to obtain accurate results, the test must follow this package insert.
- Do not interpret the test result before 3 minutes and after 20 minutes starting the test.
- Inadequate or inappropriate sample collection, storage, and transport can result in incorrect results. If specimen storage is necessary, swabs can be placed into a 0.5% saline solution for up to 24 hours. Specimens should not be stored dry.
- Do not use if the test device package or its contents are damaged.
- Do not use the kit contents beyond the expiration date.
- Do not eat, drink, or smoke in the area where the specimens and kit contents are handled.
- Use appropriate precautions in the collection, handling, storage, and disposal of patient samples and used kit contents.
- Dispose of used contents as biohazardous wastes in accordance with federal, state, and local requirements.
- Nitrile or latex gloves should be worn when performing this test.
- If the extraction buffer contacts the skin or eye, flush with copious amounts of water.
- Handle all specimens as though they contain infectious agents.

- Observe established precautions against microbiological hazards throughout the procedure and follow the standard procedures for proper disposal of specimens.
- Reagents contain sodium azide, which is harmful if inhaled, swallowed, or exposed to skin. Contact with acids produces a very toxic gas. If there is contact with skin, wash immediately with plenty of water. Sodium azide may react with lead and copper plumbing to form highly explosive metal azides. On disposal, flush with a large volume of water to prevent azide build-up.
- Do not interchange kit contents from different lots.
- Do not re-use any contents in the kit as they are single-use only.

REAGENTS AND MATERIALS PROVIDED

Materials Provided

KIT COMPONENT	AMOUNT PER KIT
Lateral Flow Assay Strips	50
Chase Buffer Ampules	50
Vials	50
Locking Caps	50
Individually Wrapped Swabs	50
Instructions for Use	1

Materials required but not provided

- Pair of gloves
- Timer

STORAGE AND STABILITY

The reagents and materials in the CovClear™ COVID-19 Antigen Test are stable until the expiration date printed on the desiccant test strip container. Do not use beyond the expiration date. The test strips must remain in the desiccant travel container until use. Store at 15°C to 30°C (60°F to 86F) sealed. Do not freeze any contents of the kit.

SPECIMEN COLLECTION AND HANDLING

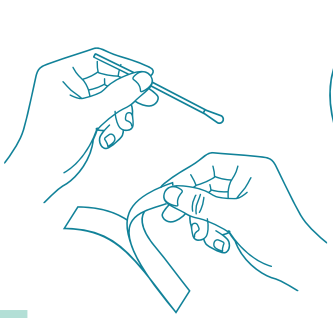
Acceptable specimen type for testing with the CovClear™ COVID-19 Antigen Test is a direct nasal swab specimen. It is essential that correct specimen collection and preparation methods be followed. Inadequate specimen collection, improper specimen handling and/or transport may yield false results; therefore, specimen collection requires specific training and guidance due to the importance of specimen quality to obtain accurate test results. Refer to the CDC Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID- 19). www.cdc.gov/coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html

LOWER NOSTRIL SWAB SAMPLE COLLECTION

Procedural Notes:

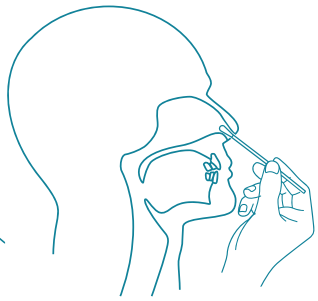
- Process the test sample immediately after collection.
- Use only provided nasal swab for specimen collection.
- Collect the specimen wearing safety gloves to avoid contamination.
- Do not touch the tip (specimen collection area) of the swab.
- Collect samples as soon as possible after the onset of symptoms.

DIRECT SWAB TEST PROCEDURE



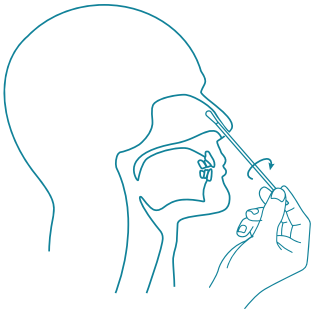
1

Remove a swab from the pouch.



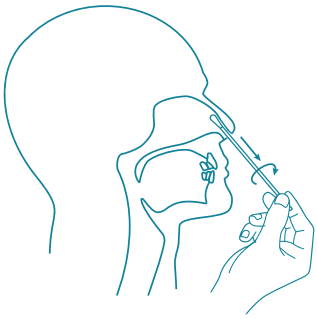
2

Place the dry swab into one of the patient's nostrils until it reaches resistance.



3

Slowly rotate the swab 7 times over the surface inside the nostril.



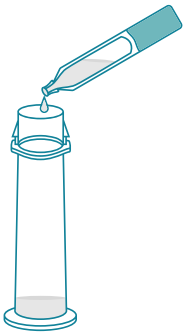
4

Slowly remove the swab from the nostril while still rotating.

Repeat steps 2-4 on other nostril.

Procedural Notes:

- Allow the test devices, reagents, specimens, and/or controls to equilibrate to room temperature (15-30°C) prior to testing.
- Remove the CovClear™ COVID-19 Antigen Test strip, extraction vial and locking cap, swab, buffer solution ampoule from its kit immediately before testing.
- The CovClear™ COVID-19 Antigen Test kit IS INTENDED to be used only with a direct nasal swab specimen.
- The CovClear™ COVID-19 Antigen Test kit IS NOT INTENDED for testing other liquid samples such as nasal wash or aspirate samples as results can be compromised by over dilution.



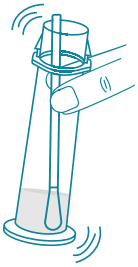
1

Pour entire buffer solution ampule into empty vial

2

Following the Lower Nostril Swab Sample Collection Procedure insert dry swab into one nostril until you meet resistance. Swirl 7 times.

Repeat with same swab in other nostril

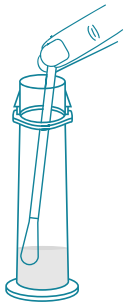


3

Place swab into prepared vial with buffer solution.

Slightly swirl the vial and swab for 30 seconds.

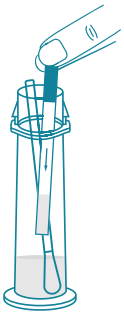
NOTE: DO NOT place the cap on the vial. DO NOT REMOVE SWAB.



4

Press tip against side of vial to squeeze liquid from swab for 10 seconds. Then place swab back into the buffer solution.

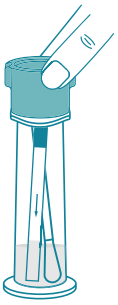
NOTE: DO NOT REMOVE SWAB



5

Place new test strip, arrow pointing down, into vial with the swab.

NOTE: Touch test strip on the colored end only.



6

Place cap securely onto the vial with the test strip and swab inside.

NOTE: Cap will permanently lock in place. DO NOT tip vial over as this will invalidate the test.

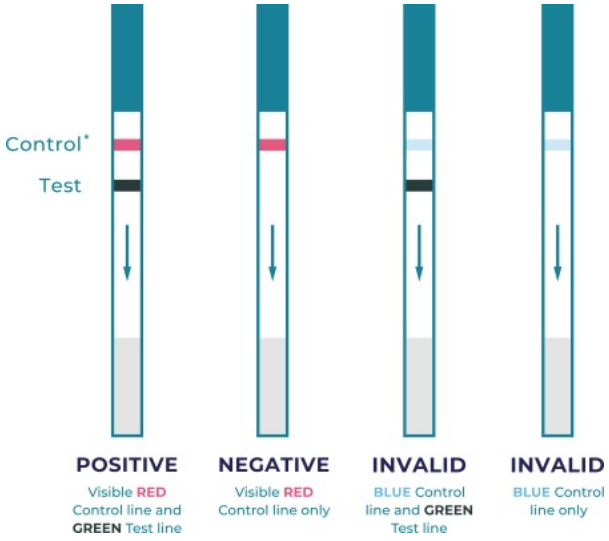
READ RESULTS WITHIN 3-20 MINUTES.

INTERPRETATION OF RESULTS

NOTE: The test results should be read and interpreted between 3 and 20 minutes after the sample application and the reading and interpretation of the results should not exceed 20 minutes. The test results should not be interpreted using any instruments.

NOTE: Before use, a faint blue control line will be visible. It will transition to red when a valid test is performed.

NOTE: The color intensity in the test line (i.e. green-colored line) will vary depending on the amount of SARS-CoV-2 nucleocapsid protein antigen present in the sample. Any faint colored line in the test region should be considered as positive.



POSITIVE: Two distinct colored lines appear: One red-colored line representing the control line and one green-colored line representing COVID-19 positive result.

NEGATIVE: One red-colored line indicates a negative result.

INVALID: If the red-colored line is not visible, the result is invalid. If the test Is Invalid, a new test should be performed with a new sample collection.

LIMITATIONS

- Negative results, should be treated as presumptive and confirmation with a molecular assay, if necessary for patient management, may be performed.
- Failure to follow the instructions for use may adversely affect test performance and/or invalidate the test result.
- If the differentiation of specific SARS viruses and strains is needed, additional testing, in consultation with state or local public health departments, is required.
- Clinical performance using VTM or saline was established on frozen specimens and performance may be different with fresh clinical specimens.
- Extracted specimens may be stable for 24 hours in 0.5% saline solution at room temperature. Specimens should not be stored dry.
- Results from antigen testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to determine infection status.
- This test will indicate the presence of SARS-CoV-2 nucleocapsid protein antigen in the specimen from both viable and non-viable SARS-CoV-2 virus. Test performance depends on the amount of virus (antigen) in the sample and may or may not correlate with viral culture results performed on the same sample.
- The detection of SARS-CoV-2 nucleocapsid antigen is dependent upon proper specimen collection, handling, storage, and preparation. Failure to observe proper procedures in any one of these steps can lead to incorrect results.
- Results from the device should be correlated with the clinical history, epidemiological data and other data available to the clinician evaluating the patient.

- This device has been evaluated for use with human specimen material only.
- False-negative results may occur if the concentration of the target antigen in the clinical specimen is below the detection limits of the device.
- This device is a qualitative test and does not provide information on the viral concentration present in the specimen.
- This test cannot rule out diseases caused by other bacterial or viral pathogens.
- The prevalence of infection will affect the test's predictive values.
- Positive and negative predictive values are highly dependent on prevalence. False-negative test results are more likely during peak activity when the prevalence of the disease is high. False-positive test results are more likely during the periods of low SARS-CoV-2 activity when prevalence is moderate to low.

CONDITIONS OF AUTHORIZATION FOR LABORATORY

The CovClear™ COVID-19 Antigen Test Letter of Authorization, along with the authorized Fact Sheet for Healthcare Providers, the authorized Fact Sheet for Patients, and authorized labeling are available on the FDA website:

https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas

To assist clinical laboratories using the CovClear™ COVID-19 Antigen Test ("your product" in the conditions below), the relevant Conditions of Authorization are listed below:

A. Authorized laboratories[1] using your product will include with test result reports, all authorized Fact Sheets. Under exigent circumstances, other appropriate methods for disseminating these Fact Sheets may be used, which may include mass media.
B. Authorized laboratories using your product will use your product as outlined in the authorized labeling. Deviations from the authorized procedures, including the authorized instruments, authorized extraction methods, authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.
C. Authorized laboratories that receive your product will notify the relevant public health authorities of their intent to run your product prior to initiating testing.
D. Authorized laboratories using your product will have a process in place for reporting test results to healthcare providers and relevant public health authorities, as appropriate.
E. Authorized laboratories will collect information on the performance of your product and report to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA- Reporting@fda.hhs.gov) and EMPOWERED DIAGNOSTICS, LLC (Technical Support at +1-954-354-2768) any suspected occurrence of false positive or false negative results and significant deviations from the established performance characteristics of your product of which they become aware.
F. All operators using your product must be appropriately trained in performing and interpreting the results of your product, use appropriate personal protective equipment when handling this kit, and use your product in accordance with the authorized labeling.
G. EMPOWERED DIAGNOSTICS, LLC authorized distributors, and authorized laboratories using your product will ensure that any records associated with this EUA are maintained until otherwise notified by FDA. Such records will be made available to FDA for inspection upon request

[1] The letter of authorization refers to, "Laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet the requirements to perform high complexity tests."

PERFORMANCE CHARACTERISTICS

Clinical Performance

A total of 76 blinded dry nasal swab samples were tested in one investigational site to evaluate the clinical performance of the CovClear™ SARS-Cov-2 Rapid Antigen Test strip. Nasal swab specimens were collected from patients with COVID-19 like symptoms during the 2020 COVID-19 season. All the Nasal swabs were added to the CovClear™ vial (either dry or in buffer). All the Nasal swab specimens were confirmed as positive or negative and validated with Ct value by the FDA EUA RT-PCR as a comparator method. The samples were randomized, blinded and tested using the instructions provided by the Instruction for Use.

All the study samples were random and assigned a study ID prior to testing. The expected results of the sample were completely blinded to the operators. 11% of the positive samples had Ct values over 30.

CovClear™ COVID-19 Antigen (retrospective samples) Performance against the Comparator Method

Covclear™ COVID-19 Antigen	Comparator		
	Positive	Negative	Total
Positive	33	0	33
Negative	1	42	43
Total	34	42	76
Positive Percent Agreement (PPA)	97% (95% CI:91%-100%)		
Negative Percent Agreement (NPA)	100% (95%CI:91%-100%)		

Patient Demographics

Age Group	Covclear™ SARS-COV-2 Rapid Antigen Test		
	Total #	Positive	Negative
≤5 Years of Age	1	1	0
6-21 Years of Age	13	8	5
22-59 Years of Age	49	20	29
≥60 Years of Age	13	4	9
Unknown	0	0	0

Analytical Sensitivity: Limit of Detection (LoD)

The LoD for direct swab was established using heat-inactivated SARS-CoV-2 isolate Hong Kong/VM20001061/2020). The strain was spiked into 0.5 saline solution prepared in accordance with BAM R66. The estimated LoD found from the initial two- fold serial dilution test was confirmed by testing 20 replicates. The confirmed LoD for direct swab was 7.12 x 10^3 TCID50/ml.

Specimen Stability:

The specimen stability was established using heat-inactivated SARS-CoV-2 isolate Hong Kong/VM20001061/2020. The strain was spiked into 0.5% saline solution at 3x the LoD (2.16 x 10^4 TCID50/ml). Samples were then Incubated at room temperature for 0, 2 6, and 24 hours respectively prior to testing. All samples tested produced no qualitative impact on test line signal intensity as compared to the 0-hour condition, demonstrating that the CovClear™ COVID-19 Antigen Test performance was not affected by sample Instability for up to 24 hours at room temperature.

Analytical Specificity: Cross Reactivity and Microbial Interference

The potential cross-reactivity (exclusivity) of a panel of common organisms was evaluated with SARS-CoV-2 negative samples using the CovClear™ COVID-19 Antigen Test. Potential microbial interference was evaluated with samples containing heat-inactivated SARS-CoV-2 isolate isolate Hong Kong/VM20001061/2020 at approximately 3x LoD. A total of 7 bacteria were tested at a target at approximately 1 x 10^6 cfu/ml. The 13 viruses were tested at concentrations between 9.87 x 10^4 and 1 x 10^5 pfu. All negative samples gave negative results at the concentrations of the potentially cross-reactive common organisms tested showing no cross-reactivity with CovClear™ COVID-19 Antigen assay. All samples with SARS-CoV-2 strain tested positive showing no microbial interference at the concentrations of the potentially interfering common organisms tested.

Potential Cross-Reactant		
Adenovirus		*Bordetella pertussis*
Enterovirus Type 68	Parainfluenza virus type 1	*Candida albicans*
Human coronavirus (OC43)	Parainfluenza virus type 2	
Human coronavirus (229E)	Parainfluenza virus type 3	*Haemophilus influenzae*
Human coronavirus (NL63)	Parainfluenza virus type 4A	*Legionella pneumophila*
Human metapneumovirus (hMPV) 16	Respiratory syncytial virus type A	*Mycoplasma pneumoniae*
Influenza B	Rhinovirus	
Streptococcus pyogenes	Chlamydia pneumoniae	*Streptococcus pneumoniae*
	Staphylococcus aureus	
	Staphylococcus epidermidis	

SARS-coronavirus was not tested as part of this study. Additional testing may be required to determine if this pathogen will generate cross-reactivity at the CovClear test line.

To estimate the likelihood of cross-reactivity with SARS-CoV-2 of organisms that were not available for wet testing, in silico analysis using the Basic Local Alignment Search Tool (BLAST) managed by the National Center for Biotechnology Information (NCBI) was used to assess the degree of protein sequence homology.

https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE=Proteins&PROGRAM=blastp&BLAST_PROGRAMS=blastp&PAGE_TYPE=BlastSearch&BLAST_SPEC=blast2seq&DATABASE=n/a&QUERY=&SUBJECTS=

- The homology between SARS-CoV-2 nucleocapsid protein and human coronavirus HKU1 nucleocapsid protein is relatively low, at 36.7% across 86.4% of sequences, but cross- reactivity cannot be ruled out.
- The homology between SARS-CoV-2 nucleocapsid protein and Mycobacterium tuberculosis total protein (3,991 proteins) is relatively low, homology-based cross-reactivity can be ruled out.
- The homology between SARS-CoV-2 nucleocapsid protein and Pneumocystis jirovecii total protein (3,745 proteins) is relatively low, homology-based cross-reactivity can be ruled out.
- The homology between SARS-CoV-2 nucleocapsid protein and human coronavirus 229E nucleocapsid protein is relatively low, but cross-reactivity cannot be ruled out. However, a result of the cross-reactivity wet study showed that CovClear™ COVID-19 Antigen had no cross-reactivity against human coronavirus 229E.
- No homologous protein was detected as a result of in silico assay with the proteins of Mycoplasma pneumoniae and the nucleocapsid protein (NP) of SARS-CoV-2. So, cross-reactivity of CovClear™ COVID-19 Antigen against Mycoplasma pneumoniae can be ruled out.

Endogenous Interfering Substances Effect

To assess substances with the potential to interfere with the performance of the CovClear™ COVID-19 Antigen, positive and negative samples were tested with the addition of potentially interfering substances. The SARS-CoV-2 target concentration in the positive samples was approximately 2x LoD. All samples tested produced no qualitative impact to test line signal intensity,, demonstrating that the CovClear™ COVID-19 Antigen Test performance was not affected by any of the 14 potentially interfering substances listed in the table below at the concentrations tested.

Potential Interfering Substances	Concentration	Potential Interfering Substances	Concentration
Whole Blood	4%	Zicam	5% v/v
Mucin	0.5%	Homeopathic (Alkalol)	1:10 dilution
Chloraseptic (Menthol/Benzocaine)	1.5 mg/mL	Sore Throat Phenol Spray	15% v/v
NasoGEL (NeilMed)	5% v/v	Tobramycin	4 µg/mL
CVS Nasal Drops (Phenylephrine)	15% v/v	Mupirocin	10 mg/mL
Afrin (Oxymetazoline)	15% v/v	Fluticasone Propionate	5% v/v
CVS Nasal Spray (Cromolyn)	15% v/v	Tamiflu (Oseltamivir Phosphate)	5 mg/mL

The interfering effects of biotin concentrations ranging between 625 ng/mL and 10 µg/mL were tested in a separate study. Biotin concentrations up to 1.25 µg/ml did not lead to false results. Biotin concentrations ≥2.5 µg/ml can cause false-negative COVID-19 results with the CovClear™ COVID-19 Antigen.

High-dose Hook Effect

The CovClear™ COVID-19 Antigen was tested up to 1.15 x 10^5 TCID50/ml of heat-inactivated SARS- CoV-2 strain and no high-dose hook effect was observed.

Technical Support

For questions, or to report a problem, please call Empowered Diagnostics at 954-354-2768.

Test system problems may also be reported to the FDA using the MedWatch reporting system (phone: 1-800-FDA-1088; fax: 1-800-FDA-1078: or http://www.fda.gov/medwatch).