Simulating the Stroke Patient and Survivor Experience:
Designing Solutions with Empathy
The first step in designing a user-centered solution is to empathize. Defined as the ability to understand and share the feelings of another, empathy is a useful tool for innovators who seek to create a solution that is both novel and relevant to the end user.

The HFA at MedStar Health fellowship, the first of its kind, engages four young professionals in distinctive learning experiences centered on health, design, entrepreneurship and leadership. It challenges them to create an innovative solution for chronic disease care.

Each year the HFA at MedStar Health fellowship starts with an exploration phase that deeply immerses the fellows in understanding the assigned chronic health problem. The exploration phase results in a major deliverable of the program—the landscape analysis report. It summarizes many of the lessons learned by the fellows during that period and informs how they approach the ideation and implementation phases of the fellowship.

A key activity of the exploration phase is simulation. Grounded in the principles of design thinking, HFA simulation activities are tailored to build the HFA fellows’ empathy for the patients and/or survivors with whom they will design their solution. Each year, simulation activities are tailored to the relevant disease state and can vary widely as a result.

2016 to 2017 HFA Simulation Overview
For the 2016 to 2017 program, the HFA fellows were challenged to create a novel solution that improves stroke care. Their research in the exploration phase focused on the full continuum of stroke care, including prevention, detection, treatment and rehabilitation. Their simulation activities had three key components:

1. Acute stroke patient simulation:
Under the leadership of the MedStar Washington Hospital Center Comprehensive Stroke Center team, the HFA fellows teamed up in twos to participate in “Code 1 simulations” in two separate sessions. In each scenario, HFA fellows took turns acting out the patient personas assigned to them by attending physician fellows and nurses in the room housing the 3T MRI. The physician fellows and nurses then simulated select steps they might take in a Code 1 situation with such patients (e.g., working through the NIH Stroke Scale), so the HFA fellows could better understand both the patient and clinician experience.

2. Stroke survivor simulation:
Under the leadership of a clinical educator from the MedStar Simulation Training & Education Lab (SiTEL), one HFA fellow was immobilized or impaired in safe, but relevant, ways and assigned to individually complete tasks that may be faced by recent stroke survivors. Meanwhile, the other HFA fellows either assisted and/or observed, then they rotated until each HFA fellow had a turn. For example, one side of the HFA fellow’s body was immobilized using a leg splint, arm sling and ankle weight, and she was given a cane and asked to walk around the lab while her teammates joined her.
3. HFA fellow-led simulations:

HFA fellows developed and led two different types of simulation activities:

a. An intensive **short-term stroke recovery simulation** lasting three days, focused on stroke survivors with physical and cognitive disabilities that might be addressed during rehabilitation through a combination of physical therapy, occupational therapy, speech language therapy and psychological counseling.

b. An intensive **long-term primary and secondary stroke prevention simulation** spanning two weeks, focused on those who have already experienced a stroke and those who are at-risk of stroke. The simulation explored primary and secondary prevention, taking into account common comorbidities and stroke risk factors, such as hypertension, cholesterol and diabetes. HFA fellows also adhered to prescribed medications—in the form of “fake medicines” that were actually vitamins or nuts—and maintained a healthy lifestyle through modified diets and exercise.

Each HFA simulation served as an empathy immersion exercise, allowing fellows to experience—in very small ways—some types of challenges stroke patients and survivors might face. At the end of the simulations, fellows met to discuss relevant takeaways and reflected on them in the blog posts shared in this document. The simulations also initiated the application and practice of design thinking methodologies that will help the fellows as they strive to create a user-centered innovation in partnership with the stakeholders it will serve.

**Inspiration for This Document**

In an effort to advance HFA's goal to increase innovation capacity in the health system, MedStar Institute for Innovation (MI2) has created this document to disseminate the 2016 to 2017 HFA fellows' simulation experiences. In addition to sharing HFA's work and methodologies, this piece aims to inspire other healthcare professionals to create and conduct their own simulation exercises as a means to further encourage patient-centered care and innovation. While HFA's work is tailored to the program's health focus, much can be learned from the conceptual approach—and replicating it can benefit a variety of stakeholders and industries.
Karen Moriarty (Poole), MedStar Washington Hospital Center stroke coordinator/clinical specialist, coordinated two simulation experiences in partnership with Hospital Center Nursing Director Janet L. Thorne, her team, and attending Hospital Center physician fellows.

In each experience, HFA fellows were given one of the following persona cards, asked to memorize their persona, then “act” as this patient as the clinical team worked through many aspects of a Code 1 situation with one HFA fellow while the other watched. Their experiences ranged from simulating limb weakness as the physician worked through the NIH Stroke Scale with them, to reviewing existing MRI scans to better understand examination and diagnosis, to hearing how risks may be discussed with them if they were a candidate for certain drugs or procedures.

The medical team huddles around my stretcher, looking attentively at how I respond to their questions. ‘When did you first start feeling weakness on the right side of your body?’ ‘Can you lift your right arm for me please? ... Hold it ... Hold it ... Ok.’ ‘Can you tell me today’s date?’

We’re at MedStar Washington Hospital Center, a comprehensive stroke center, and Dr. Tina Burton’s team is leading each HFA fellow through a Code 1 stroke simulation.

The little slip of paper Dr. Burton handed me earlier notes that I’m assuming the persona of a 57-year-old woman who’s experiencing a stroke. After three weeks of immersive shadowing experiences that let us glimpse into the different phases of the stroke continuum—from acute care to rehabilitation—we’re making our first very modest attempts to understand what it’s like to ‘walk in the shoes’ of a person who’s experiencing stroke.

Taking this first step is incredibly formative for us as fellows. Our goal is to create innovative, patient-centered design aimed at improving stroke care, and if there’s a bridge that will help us reach that goal, its name is design thinking.

Empathy is the first block of design thinking that paves the path to creating patient-centered design. Simulations are a chance for us to engage with what it feels like to face some of the challenges stroke patients and survivors encounter day-to-day, on a very human level.”

– HFA Fellow Katia Vlasova
Persona B
38-year-old female RMCA stroke

Symptoms:
• Slurred speech
• Confused
• Left facial droop
• Difficulty looking to the left with double vision
• Left arm and leg weakness (left limbs are completely limp)
• Not able to see anything on left side

History of Present Illness:
• Having lunch with husband and had acute onset of slurred speech, difficulty drinking water and couldn’t stand up from the table at noon
• Husband is in transit without a cell phone
• Patient confused and unable to provide further history

Past Medical History:
• No known medical problems
• No known surgeries

Family History:
• No history of prior stroke. Mother had multiple miscarriages

Social History
• Occasional alcohol, smokes one to two cigarettes per day, no drugs

Allergies:
• None

Medication:
• Birth control, missed recent doses, last menstrual period—two weeks ago with intercourse in interim

Vital Signs:
1. T 37.2, BP 230/118, MAP 121, HR 62, RR 24, oxygen saturation 99 percent RA
2. Before tPA BP 205/100, HR 58

Labs:
• Glucose 128, Cr 1.0, INR 0.8, PLTs 179, beta HCG positive
II. STROKE SURVIVOR SIMULATION AT SiTEL

MedStar Simulation Training & Education Lab (SiTEL) Clinical Educator Les Becker led planning/execution for nearly four hours of experiential activities in the Washington, D.C., Simulation Center.

Each HFA fellow took turns completing tasks with assigned impairments or mobility limitations, while the others assisted or observed. The time included debriefing with Les about how the HFA fellows felt, and presenting their fellow-led simulation ideas to him for feedback.

Tasks and activities included:
• Participate in interview with a toothpick held in the corner of the mouth.
• Complete a paper form with nondominant hand.
• Simulate Activities of Daily Living (ADLs) after having walked to the bathroom at the rear of the MedStar SiTEL Simulation Center with a cane.
• Perform additional ADLs (e.g., folding and piling towels and washcloths).
• Conduct dysphasia exercise (must ask their family member to perform a particular action, using nondominant hand and notepad).
• Walk several laps around the MedStar SiTEL Simulation Center using a cane while impaired.

BLOG EXCERPT:

“It’s humbling to realize that spending a few hours or a few days electing to confront challenges that stroke survivors navigate on a daily basis is really only giving us a small glimpse into the peaks and valleys of life after stroke. However, sometimes taking the time to walk a mile in someone’s shoes can really open your eyes, and I hope that for us, this will mean discovering opportunities for how we can improve quality of life for stroke patients and survivors.

With the MedStar SiTEL team, the first thing we do is gear up. To simulate the one-sided weakness a stroke survivor might experience, Les helps each of us immobilize the knee and wrist joint on our dominant side, adding a triple layer of medical gloves and two pound weights for our ankle and wrist to further reduce dexterity.

We each have a chance to fill a weekly pill box with medication, fill out a medical history form for a doctor’s appointment, walk around with a cane, get in and out of bed, fold laundry and brush our teeth while wearing this gear. We also try to simulate one-sided facial droop while speaking by holding toothpicks in one side of our mouth.

It quickly becomes apparent how differently we have to approach Activities of Daily Living that we might not have thought twice about before. Filling out a doctor’s appointment form now takes thrice as long and getting out of bed to get a glass of water transforms from a simple task into an activity that takes planning and concentrated coordination. The effect of facial droop on my speech makes me self-conscious to speak up—I withdraw and try to minimize the length of my responses to simple questions.”

– HFA Fellow Katia Vlasova
III. A. FELLOW-LED STROKE RECOVERY SIMULATION

The purpose of this HFA fellow-led, short-term exercise was to simulate some of the disabilities and challenges with Activities of Daily Living (ADLs) that stroke survivors may experience.

For 72 hours, each HFA fellow took on one of the following personas that mirror possible profiles of stroke survivors. During this time, they attempted to complete typical activities such as cooking, taking the Metro, hailing a cab, interacting with peers, etc. The simulation primarily took place at the HFA fellows’ respective homes and their primary workplace, MedStar Institute for Innovation.

Patient Profile 1

HFA Fellow:
• Katia Vlasova

Age and Gender:
• 65-year-old; female

Diagnosis:
• Left hemispheric stroke that resulted in hemiparesis, dysphagia and fluent aphasia

Functional status at time of discharge:
• Pronounced weakness in entire right side
• Difficulty swallowing, frequent coughing during drinking/eating
• Impaired communication and incoherent speech, resulting in patient frustration

Discharge equipment:
• Walking cane

Continued therapies at time of outpatient rehab:
• Stroke Comeback Club, and participation in peer wellness program (e.g., gym and trainers at MedStar National Rehabilitation Hospital, or MedStar NRH)

Special diet:
• Liquid diet required as a result of dysphagia
• Low-sodium intake due to hypertension comorbidity

History of present illness:
• History of hypertension, anxiety/depression, diabetes

Home and financial situation:
• Low income, living alone, no family support

Summary of the short-term simulation:
• Katia simulated right-sided weakness by wearing wrist/ankle weights. She also wore a glove on her right hand for sensory inhibition. To simulate fluent aphasia, Katia spoke in fragmented sentences. As a simulation activity, Katia typed with her glove-covered right hand and attended a peer wellness program session at MedStar NRH.
Patient Profile 2

HFA Fellow:
• King John Pascual

Age and Gender:
• 67-year-old; male

Diagnosis:
• A high left frontoparietal infarct with right dominant weakness, impaired recall, impaired balance

Functional status at time of discharge:
• Pronounced weakness in entire right side. Patient has mild aphasia causing slow, interrupted speech. Recall skills are impaired.

Discharge equipment:
• Cane

Continued therapies at time of outpatient rehab:
• Reading exercises; seated yoga

Special diet:
• N/A

History of present illness:
• Stable anemia, diabetic neuropathy, hypertension, post-thyroidectomy

Home and financial situation:
• Living with husband; no kids

Summary of the short-term simulation:
• King simulated right-sided weakness by wearing an arm sling and leg brace. He walked with a quad cane. To simulate mild aphasia, King consciously slowed down and interrupted his speech when talking with his colleagues in person and on the phone. To simulate recall impairment, King asked his colleagues to repeat what they had just said in conversation or feigned confusion when trying to remember basic facts and information. As per recommended therapies at discharge, King did seated yoga for 25 minutes in the evening and read one news article aloud before bedtime based on reading rehabilitation guidelines.

BLOG EXCERPT:

“While in ‘full gear,’ I experimented with several Activities of Daily Living (ADLs): taking a stroll in the park, riding the Metro, cooking dinner and getting in and out of a cab. Each of these was extremely difficult to complete. For instance, while walking in the park, I noticed that I was fatigued more easily because coordinating my movements took more energy. Moreover, when downward hills were ahead, I was more mindful of potential falls because I impaired my balance through my simulated disability. When it came to cooking, I found myself struggling with basic things such as carrying kitchen equipment and chopping vegetables with only one good hand or moving from point A to point B with my cane. Multitasking was out of the question: I couldn’t, for example, hold my mug securely while standing because I needed my good hand to hold on to my cane. Imagine managing your diet as a stroke survivor: restaurant food is convenient, but often unavoidably high in sodium, yet cooking at home while recovering is, as my simulation experience revealed, a daunting task.”

– HFA Fellow King John Pascual
Patient Profile 3

HFA Fellow:
• Michael Mezher

Age and Gender:
• 30-year-old; male

Diagnosis:
• Right cerebrovascular accident with general paresis and mild aphasia

Functional status at time of discharge:
• General weakness on both sides of the body (although more so on the left side). Mild aphasia. Difficulty multitasking

Discharge equipment:
• None

Continued therapies at time of discharge:
• None

Special diet:
• Low-sodium diet, low cholesterol diet

History of present illness:
• History of high cholesterol and hypertension

Home and financial situation:
• Low-income; returning quickly to work is a must

Summary of the short-term simulation:
• Michael simulated general paresis by wearing ankle and wrist weights for the duration of the simulation. The weights added to the left side were greater than the weights on the right side. The simulation also involved listening to music as a distraction for the duration of the day to impair multitasking capabilities.
Patient Profile 4

HFA Fellow:
• Stephanie Guang

Age and Gender:
• 57-year-old; female

Diagnosis:
• Intraparenchymal hemorrhage. Resulting contralateral facial weakness and contralateral sensory loss. Homonymous hemianopsia, aphasia, visual neglect and apraxia

Functional status at time of discharge:
• Complete loss of left visual field. Difficulty swallowing during meals. Anomic aphasia with difficulties finding the right words for speaking/writing. Very mild weakness but motor control and ambulation is otherwise functional

Discharge equipment:
• None

Continued therapies at time of discharge:
• Speech therapy, at-home head and neck exercises to treat visual neglect

Special diet:
• Thickened fluids and softer foods. Low-sodium diet

History of present illness:
• History of hypertension

Home and financial situation:
• Living alone, middle-class, suburban neighborhood, necessary to return to work

Summary of the short-term simulation:
• Stephanie simulated left-sided facial weakness and speech impairment by using tape to disable muscles around the mouth. She also wore glasses with the left half of each lens occluded for a hemianopsia effect. Stephanie also placed an ear bud, playing an audiobook or distracting music, into one ear to create an empathetic experience for aphasia and communication difficulties. To simulate the difficulty in finding words that comes with anomic aphasia, Stephanie set a rule to only use words that do not contain the letter “y.” She also thickened all the liquids she consumed and crushed the medications she took for easier swallowing. Since her persona is pre-retirement age, she attempted to “return to work” and perform office job tasks with the aforementioned disabilities.

BLOG EXCERPT:

“I tried to be deliberate about my attitude during the simulation. I wanted to avoid taking on a ‘woe is me’ or ‘my life is pitifully hard’ outlook. I definitely wanted to experience the frustration and desperation that might come with living with disabilities, but I also wanted to empathize with how the patients we’ve met learn to cope and adapt their lives in the face of their challenges.

During my simulation experience, another sense of constant deliberation took over my life as well. Everything I did, even routine actions or speaking a sentence, had an added layer of intentionality and effort.

I need to wake up and brush my teeth, wash my face, and eat breakfast before going to work. Oh right, I also need to take a blood pressure reading and take my (fake) medications. Okay, it’s a bit tough because of my visual impairment, so how much longer is that going to take me? I should set my alarm clock for 30 minutes earlier than usual to account for this.”

– HFA Fellow Stephanie Guang
III. B. FELLOW-LED PRIMARY AND SECONDARY STROKE PREVENTION

The objective of this HFA fellow-led, 14-day simulation was to gain firsthand exposure to the dietary and lifestyle management needs in the primary and secondary prevention of stroke. Activities largely took place at the HFA fellows’ respective homes, MedStar Institute for Innovation (MI2), and the Washington, D.C., offices of 1776, a global startup incubator and seed fund where MI2 is a founding partner and the HFA fellows spend a portion of their time working.

More specifically, the HFA fellows wanted to gain a deeper understanding of how people at-risk for stroke and stroke survivors manage their medications, blood pressure, diet and wellness. The “baseline” criteria for each simulation included: 1) a low-sodium diet; 2) blood pressure monitoring/log-keeping; 3) taking and tracking “medication,” using nuts and vitamins as pills and 4) tracking preparation time and/or budgeting costs of food. Each HFA fellow could also choose individual simulation activities beyond these, such as: managing diabetes (e.g., low-carbohydrate diet and glucose monitoring); maintaining a low-cholesterol and low-fat diet; incorporating light physical exercise (e.g., yoga and jogging) or pursuing physical, occupational or speech therapy.

In addition to conducting general online research, the HFA fellows referred to American Heart and Stroke Association resources for stroke prevention to guide their work, covering diet, physical activity and exercise, cognitive rehabilitation and more.

**Patient Profile 1: Katia Vlasova**

Katia again assumed the persona of a 65-year-old female recovering from stroke, with her long-term simulation focused on secondary prevention. As a hypertensive, diabetic, post-stroke patient, she spent 14 days adhering to a low-sodium diet, regularly monitoring/recording blood pressure, managing diabetes with a low-carbohydrate diet and medication, and adhering to an extensive list of prophylactic post-stroke medications. As per secondary prevention measures, she incorporated light physical exercises. To help mitigate anxiety/depression, she also joined a local meditation group.

**DISCHARGE INFORMATION:**

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<thead>
<tr>
<th>Condition</th>
<th>“Medications” (represented by nuts and vitamins)</th>
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<tr>
<td>Blood pressure control</td>
<td>Amlodipine (Norvasc), 5 mg 1x/day, by mouth, Lisinopril 40 mg, 1x/day, by mouth, Metoprolol tartrate 25 mg, 2x/day, by mouth</td>
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<tr>
<td>Stroke and heart attack risk</td>
<td>Enteric-coated aspirin 81 mg, 1x/day, by mouth, Clopidogrel (Plavix) 75 mg, 1x/day, by mouth</td>
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<tr>
<td>reduction</td>
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<tr>
<td>DVT prophylaxis</td>
<td>Enoxaparin (Lovenox) 40 mg, Subcutaneous injection 1x/day</td>
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<tr>
<td>Diabetes control</td>
<td>Glargine insulin (Lantus) 22 units, subcutaneous injection - 1x/day - evening Lispro insulin (Humalog) 3 units, subcutaneous injection - 3x/day - before breakfast/lunch/dinner</td>
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<td>General health</td>
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<td>Sleeping aid</td>
<td>Melatonin 3 mg before sleep</td>
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<td>GI prophylaxis stomach</td>
<td>Famotidine (Pepcid) 20 mg, 1x/day - evening, by mouth</td>
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<td>protection</td>
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**BLOG EXCERPT:**

“At first, I felt like I was failing the simulation horribly. How could I have forgotten to measure my blood glucose level two days in a row?! It was hard to be consistent with my blood pressure measurements, my blood pressure cuff coming with me in my purse wherever I went. I did my best to keep track of my dietary intake using the MyFitnessPal® app, but this too required me to remember and pause to diligently input the dietary information from each meal. There were also my medications–12 pills to be taken daily (I used vitamins, nuts and candy ‘pills’ for my simulation).

But then I realized that I wasn’t failing at the simulation. Failing to be diligent about each practice and slipping up in maintaining my new habits was exactly the point. With this new perspective, I looked at the simulation with new eyes: if I forgot to measure my blood pressure and measure my blood sugar, chances are there might be a stroke survivor who faces the same adherence challenges that I did.”

– HFA Fellow Katia Vlasova
**Patient Profile 2: King Pascual**

King simulated a 45-year-old male who recently had a Transient Ischemic Attack (TIA). He was borderline hypertensive, but not at-risk for diabetes. His focus was on secondary prevention in an effort to avoid the onset of a larger stroke. King was able to jog and his condition allowed him to walk without a cane. However, because of the TIA, he simulated impaired executive function and short-term memory. His activities outside of the baseline thus included actively using a day planner, jogging for two miles in the morning for 14 days, light-weight training three times a week and playing brain games using Blue Ocean Brain's platform.

**Patient Profile 3: Michael Mezher**

Michael simulated a 70-year-old male at high risk for stroke due to atrial fibrillation and hypertension. His focus was on primary prevention of stroke, which meant following a strict low-sodium diet and partaking in daily light-to-moderate exercise.

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<tr>
<td>Blood pressure control</td>
<td>Amlodipine (Norvasc), 10 mg 1x/day, by mouth Hydralazine 100 mg, 3x/day, by mouth Losartan (Cozaar) 100 mg, 1x/day, by mouth Metoprolol succinate 75 mg, 1x/day, by mouth</td>
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<td>Cholesterol control</td>
<td>Pravastatin (Pravachol) 80 mg, 1x/day - evening, by mouth</td>
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<td>Stroke and heart attack risk reduction</td>
<td>Enteric-coated aspirin 325 mg, 1x/day, by mouth</td>
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<td>Bowel regularity/constipation prevention</td>
<td>Senokot-S tablets, 2x/day - by mouth with 8 oz water</td>
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<tr>
<td>General health</td>
<td>Multivitamin, 1x/day - by mouth</td>
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**BLOG EXCERPT:**

“The idea of adhering to a new diet with a long-term goal, like lowering my cholesterol or my blood pressure, proved to be unexpectedly challenging (even for a couple weeks). Even more challenging and unexpected was that nearly all of my favorite foods contain either high levels of sodium OR high levels of cholesterol. This highlighted the constant balancing act that stroke survivors or at-risk populations face: I could eat unsalted red meat or eggs and get away with not consuming a high amount of sodium, but I’d have to limit the amount I could eat in order to ensure I didn’t consume too much cholesterol.

Ultimately, as I went through the simulation, it became increasingly clear that it was nearly impossible to comprehensively simulate what a stroke survivor actually experiences. This isn’t just because it’s difficult to simulate the major impairments associated with stroke. It’s because the disabilities caused by stroke vary widely, and the psychological effects these disabilities have on stroke survivors vary to an even greater degree. It will be important for our team to consider this fact when using the simulation experience as a point of reference for thoughts and ideas.”

– HFA Fellow Michael Mezher
Patient Profile 4: Stephanie Guang

Stephanie took on the persona of a 41-year-old woman with gestational diabetes and pregnancy-induced hypertension (PIH)* to simulate primary prevention when at-risk for stroke. With risk for pre-eclampsia compounded onto risk for stroke, Stephanie took steps to rigorously monitor blood pressure, dietary intake and weight. She adopted a low-carb, low-sodium diet and managed her weight by daily measurement. Stephanie checked her blood sugar four times a day, first thing in the morning and after each meal, using a glucometer. Stephanie also simulated taking daily calcium supplements and low-dose aspirin.

*Note: Stephanie did not simulate pregnancy physically.

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<tr>
<th>Condition</th>
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<tr>
<td>Deep Venous Thrombosis Prophylaxis (DVT)</td>
<td>Enoxaparin (Lovenox), 40 mg subcutaneous injection, 1x/day - morning</td>
</tr>
<tr>
<td>Stroke and heart attack risk reduction</td>
<td>Enteric-coated aspirin 81 mg, 1x/day, by mouth</td>
</tr>
<tr>
<td>Blood pressure control</td>
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About Us

About Health for America (HFA) at MedStar Health
The HFA fellowship inspires the best and brightest young professionals to tackle the nation’s most pressing health challenges through innovation. HFA is embedded in MedStar Institute for Innovation (MI2) to make a difference on three levels: motivating next-generation leaders to focus on health, creating novel solutions that improve health outcomes and increasing innovation capacity in the health system. HFA grants fellowships to interdisciplinary talent within three years post-bachelor’s degree and offers unmatched learning experiences that center on health, design, entrepreneurship and leadership. The 2016 to 2017 HFA fellows are (pictured left to right):

• Ekaterina (Katia) Vlasova

• King John Pascual

• Stephanie Guang

• Michael Mezher

Learn more at HealthForAmerica.org.

About MedStar Institute for Innovation (MI2)
MedStar Institute for Innovation is unique among innovation centers that are embedded in health systems. MI2’s approach is to create an innovation ecosystem across MedStar Health that fosters the vast creative talent and energy of its 31,000 associates and 6,000 physicians. MI2 itself has developed deep technical expertise in human factors engineering, health influence and engagement, innovative learning and simulation, and digital health and data science. MI2, chartered in 2008, also serves as the portal for engaging outside startups and entrepreneurial collaborators to apply new ideas and innovative approaches to care for people and advance health. For more information, see MI2.MedStarHealth.org.