

令和3年度個別学力試験問題

英 語

(医 学 科)

解答時間 80分

配 点 100点

注意事項

1. 試験開始の合図があるまで、この問題冊子の中を見てはいけません。
2. 受験番号及び氏名を解答用紙の所定の欄に記入しなさい。
3. 解答は解答用紙の指定されたところに横書きで記入しなさい。
4. 試験時間中に問題冊子及び解答用紙の印刷不鮮明、ページの落丁及び汚損等に気が付いた場合は、手を挙げて監督者に知らせなさい。
5. 問題冊子は持ち帰ってもかまいません。



1 次の英文を読んで、以下の問いに答えなさい。

My dad told terrific stories, especially about his rough childhood in 1940s Brooklyn. He hinted that a few relatives were mobsters and swore that our family name was really something like Mandeira and that we are partially Spanish.

One thing my dad never talked about was the prominent scar on his neck. He let my siblings and me believe he was slashed in a fight on those dangerous Brooklyn streets. Shortly after I graduated from college, he revealed the truth. The scar resulted from an operation he had had to remove a cancerous tumor at the base of his tongue. Whatever they did kept the cancer in check for more than 20 years. It came back. He died about a year later.

His absence looms large in my life. I desperately wanted to maintain a connection to him... which is why I spit into a tube and sent it to 23andMe. I wanted to know if the Spanish association was real. And I figured while I was spitting, I would pay the extra fee and find out if I might die of cancer, too.

The report said that my genetic heritage is 99.9 percent Ashkenazi Jew—which doesn't rule out that my ancestors lived in Spain or were born there to a pair of Ashkenazim. As for the cancer, that's not straightforward either. The test, which doesn't actually screen for what my dad had, was negative for the cancers it does screen for—breast and ovarian. Whew, right? Not so fast. A negative is no guarantee you won't get the disease. It just means they didn't find the anomalies they were looking for. Even positive results can be difficult to interpret, since your ethnic group, family history, and lifestyle issues like smoking, drinking, diet, and stress are also important factors.

“Genetic testing is only one part of a complex process that includes genetic risk assessment, diagnosis, and disease management,” says Maximilian Muenke, MD, chief executive officer of the American College of Medical Genetics and Genomics. In other words, genetics is just one part of a very complicated puzzle.

### **What is genetic testing?**

It's a diagnostic medical test that can identify or confirm a specific genetic or chromosomal condition or the chance that you might develop it or pass it along. Doctors order up genetic tests for their patients, especially for those with a family history of a specific disease, and a lab processes them. The results can provide helpful information for diagnosing, treating, and preventing illness.

Since the Human Genome Project catapulted genetics to a whole new level in the early 2000s, gene analyses have become essential to medical research. At the same time, genetic

testing crossed the bounds of science and medicine to private companies that developed and marketed direct-to-consumer (DTC) testing kits, which you could buy yourself without involving a doctor or another health-care professional.

### **How do the doctor-ordered and DTC kits compare?**

The traditional route, if you have a family history or symptoms of a disease with a genetic component or are pregnant, is to have your doctor, a genetic counselor, or nurse practitioner send your sample to a clinical setting for testing. The labs, in this case, do what's called gene sequencing, which looks at large swaths of DNA. These tests can be performed on blood, hair, skin, or amniotic fluid. Because results can be life-changing, doctor-ordered tests are accompanied both before and after by counseling from a health-care pro—a key component of the testing process.<sup>(3)</sup> The results need no confirmation, and although these tests can be costly compared with DTC kits, they are usually covered by insurance.

I used a 23andMe genetic health test (\$199). DTC kits can screen for disease risk, help you choose a diet, or tell you how you might react to medication. Most DTC kits do an analysis called genotyping, derived from a saliva sample that you submit, which only looks for information at specific places in the DNA where we know essential data is located. Since the test isn't as definitive as one from a doctor, nor does it take into account other data useful for risk assessment,<sup>(4)</sup> such as ethnicity and lifestyle habits, DTC kit results should be confirmed by a medical professional.

Recently, hybrid options have become available. Ancestry, for example, rolled out two (starting at \$179), which use the same sequencing technology as some of the tests your doctor may order. You fill out a family health history and collect your own sample, but the test itself is ordered through the company's medical partner, PWNHealth. What you get back is an array of options for how much information you want and when you want it, with the choice to talk to a genetic counselor.

There are also some clinical labs—including Invitae; Color; and PerkinElmer Genomics, in collaboration with Helix—that allow customers to initiate tests online. You fill out a health questionnaire, and the request has to be approved by a medical professional. These labs provide a full sequencing analysis of all included genes, similar to other tests that your doctor might order, and counseling services. The cost ranges from \$250 to \$300.

### **How accurate are the results?**

“If you are concerned about a disorder that runs in your family, the first step is to talk to a medical geneticist, who, based on your family's history and a physical exam, can help identify

which test is best for you,” says Dr. Muenke. Genotyping—especially if you are at real risk, meaning you are showing symptoms or have a strong family history—isn’t what you want to rely on here.

Take the 23andMe report for BRCA1 and BRCA2: It includes three specific genetic variants in the BRCA1 and BRCA2 genes that are associated with an increased risk for developing breast cancer. To compare, clinical lab Invitae looks at all the variants in genes like BRCA1 and BRCA2 that can increase the risk of breast cancer. This approach gives consumers much more information,<sup>(5)</sup> and helps them decide about making big life decisions, such as having a mastectomy. Still, considerations of time and expense (or simple curiosity) cause many people to start with DTC kits for their genetic data.

### **What should I do with the information I get back?**

“When DTC genetic tests first came out, I was not a huge fan,” says Roshini Rajapaksa, MD, an associate professor of medicine at NYU School of Medicine, an attending physician at NYU Langone Health, and *Health*’s contributing medical editor. “I thought it was a Pandora’s box. But [the tests] have evolved.”<sup>(6)</sup> You don’t just get the results thrown at you.”

It’s good that patients are proactive about their health care, says Dr. Rajapaksa. “The more knowledge, the better,” she says. “But all of this info should be discussed with a doctor to avoid anxiety.” Also advised is a consultation with your health-care provider about confirmation testing.

[注]

|  |                               |
|--|-------------------------------|
| amniotic fluid : 羊水                          | an array of : ずらりと並んだ         |
| anomaly : 異常                                 | attending : 勤務医の              |
| cancerous : ガンの                              | chromosomal : 染色体の            |
| desperately : 猛烈に                            | diagnosis : 診断                |
| disorder : 疾患, 障害                            | ethnicity : 民族性               |
| genotyping : 遺伝子型決定                          | hybrid : 混合の                  |
| loom large : 不気味に立ちのぼる                       | mastectomy : 乳房切除術            |
| mobster : 犯罪組織の一員                            |                               |
| nurse practitioner : 特定看護師(一定の医療行為ができる登録看護師) |                               |
| ovarian : 卵巣の                                | proactive : 先を見越した行動をとる       |
| questionnaire : アンケート                        | saliva : 唾液                   |
| scar : 瘢痕, 傷跡                                | screen : 検査する                 |
| sibling : 兄弟姉妹                               | slash : 切りつける                 |
| spit : 唾を吐く                                  | straightforward : 明快な, 分かりやすい |
| swath : 帯状のもの                                | tumor : 腫瘍                    |
| 23andMe : 企業名                                | variant : 変異型                 |
| whew : ほっ, ヒュー(安心などを表す声)                     |                               |

問 1 下線部(1)の理由を日本語で簡潔に説明しなさい。

問 2 下線部(2)と(6)の本文中の意味に最も近いものを、それぞれア～エの中から1つ選び、記号で答えなさい。

(2) catapulted      [ア. fixed      イ. invented      ウ. raised      エ. reversed]

(6) evolved      [ア. dissolved      イ. failed      ウ. improved      エ. surged]

問 3 下線部(3)の具体的な内容を日本語で簡潔に説明しなさい。

問 4 下線部(4)を日本語に訳しなさい。

問 5 本文中の乳がんリスクに関する遺伝子検査結果を例として、下線部(5)の‘this approach’と他の検査方法を比較しながら、‘much more information’の内容を具体的に説明しなさい。

2

次の英文を読んで、あとの a ~ f の〔 〕内の語(句)を正しく並べ替え、本文中の【 (1) 】~ 【 (6) 】の適切な場所に入れなさい。解答欄には、a, b などの記号は書かず、並べ替えた英文のみを記入すること。

In 2011, my husband, Pete, began having strange episodes of light-headedness. They lasted less than a minute and often happened when he exercised. He went to see his longtime primary care physician, who suspected he was dehydrated.

She prescribed Gatorade. But the episodes got more frequent and severe. One night at dinner with the kids, Pete completely zoned out. He didn't understand what we were saying, and he wasn't able to get any words out.

We immediately called his doctor, but we couldn't get her on the phone. Her nurse referred us to a neurologist, but he had a six-week wait for an appointment. After some begging, we got in sooner, and he sent Pete for an MRI. The scan showed that Pete had a brain tumor the size of a golf ball.

Thankfully, after a long and harrowing journey, Pete has fully recovered, but my experience navigating that medical crisis now helps inform and inspire my work as a health-care journalist. If I had to distill everything I've learned over the years as a patient, spouse, parent, and medical reporter into one lesson, it's this: Trust but verify.

While I believe most doctors have our best interests at heart, our system is deeply flawed. Medical 【 (1) 】 in the United States—in fact, most of us will receive an incorrect or late diagnosis at least once in our lives, often with serious consequences, according to a National Academy of Medicine analysis. News headlines about outrageous bills, conflicts of interest, and depersonalized care plant more seeds of doubt.

Doctors are keenly aware of the problems, but 【 (2) 】. Electronic record keeping, a boon to efficiency in many ways, takes an average of nearly six hours of a primary care physician's day—more time than is spent with patients. Most face-to-face visits are now about 15 minutes—and down to only 8 minutes in some parts of the country, says Andrew Morris-Singer, MD, president of Primary Care Progress, a nonprofit working to improve primary care. “Physicians are literally running from room to room,” he says.

What's more, insurance companies have cut doctors' payments, forcing them to see more patients or invest in lucrative sidelines (such as selling supplements, medical devices, or imaging services) to keep their practices in the black.

These changes have “driven a huge wedge” into the patient-physician relationship, Dr. Morris-Singer says.

This is not a minor concern. Research shows that without trust a patient might not 【 (3) 】



quality medical advice. Patients who trust their health-care providers are more likely to follow their treatment plans, have fewer symptoms, practice healthier behaviors, and be more satisfied with their care. In addition, a doctor who knows you and your health history is less likely to overprescribe or send you for unnecessary tests. Finally, I believe a doctor is more likely to make an extra effort for you if you have a relationship. It's just human nature.

Unfortunately, Pete's difficulty getting in to see both his primary care doctor and the neurologist dented our confidence that he would get the care he needed. And then things got scarier.

The MRI showed that Pete had a meningioma, the "good" kind of brain tumor, the neurologist explained to us, because it is usually benign. But Pete's was large, and it was wrapped around his carotid artery, pressing on his optic nerve and extending into the speech center of his brain.

The neurologist sent us straight to a neurosurgeon, supposedly the best in the city. He spent an hour patiently answering our questions, but his prognosis was terrifying: The tumor needed to be removed, and [ (4) ] and possibly without the ability to speak. With Pete's episodes of light-headedness occurring more frequently, the surgeon scheduled the surgery for the following week.

What happened next can be described only as a stroke of luck. Pete and I reached out to the rabbi at our temple for comfort, and she connected us with another congregant whose son had undergone surgery to remove a brain tumor a few years earlier. She encouraged us to get a second opinion from the neurosurgeon at Duke University Medical Center who had operated on her son. "He can do things other surgeons can't," she said.

As a health reporter, I knew objectively that a second opinion could be valuable. A 2017 Mayo Clinic study found that one in five people who sought a second opinion went home with a completely new diagnosis. Another 66 percent got new information or a revised diagnosis. A second opinion can also reveal different treatment options.

The woman from our temple insisted and even called Duke to get an appointment for us. That appointment changed everything. The Duke surgeon told us he used a different technique. It was lower risk, and it would spare Pete's eyesight.

When Pete was at Duke hospital for his brain surgery, we wanted to connect with his medical team even though we would be there for just a short time—as with any relationship, I believed that personalizing our interactions would help ensure the best care.

I placed a family photo in the recovery room, not just [ (5) ] and a father to three young children. I delivered bags of homemade chocolate-chip cookies to Pete's nurses. And we gave the surgeon a note from our eight-year-old daughter. It said "Please take care of my daddy."

When they finally took Pete into the operating room, I shed tears for the first time. We had followed every instruction and chosen the best doctor. Now Pete's life was in the surgeon's hands. Eight hours later, he was wheeled to the recovery room. The operation was a success.

A few days later, a biopsy revealed that the tumor was a rare aggressive type of meningioma that exhibits cancer-like behavior. The surgeon sent us to a Duke oncologist who recommended radiation to prevent a recurrence. She told us there were different types of radiation therapy but little consensus on which was best and to take our time making a decision while Pete healed.

We talked with the oncologist and decided to do the radiation closer to home rather than under her care at Duke. But her honesty and understanding in that situation helped build the foundation for a physician-patient relationship that Pete values to this day. He treks to Duke to see her several times a year to make sure the tumor hasn't returned. He often emails her with general questions about his health—even though he has a new primary care physician—and she always takes the time to reply. They [ (6) ]: a sense of trust.

[注]

|  |                                 |
|--|---------------------------------|
| benign : 良性の                               | biopsy : 生検                     |
| boon : ありがたいこと                             | carotid artery : 頸動脈            |
| conflict of interest : 利益相反                | congregant : (宗教上の) 礼拝者         |
| consensus : 一致した意見                         | dehydrated : 脱水状態の              |
| dent : 低下させる                               | depersonalized : 没個性的な, 患者主体でない |
| diagnosis : 診断                             | distill : まとめる                  |
| flawed : 不備がある                             |                                 |
| Gatorade : ゲータレード(スポーツドリンクの商品名)            |                                 |
| harrowing : つらい, 痛ましい                      | light-headedness : 頭がふらふらした状態   |
| lucrative sideline : もうかる副業                | meningioma : 髄膜腫                |
| MRI (magnetic resonance imaging) : 磁気共鳴画像法 |                                 |
| neurologist : 神経科医                         | neurosurgeon : 脳神経外科医           |
| oncologist : ガン専門医                         | optic nerve : 視神経               |
| outrageous : 法外な, とんでもない                   | prescribe : (薬を) 処方する           |
| prognosis : (病気の) 予後(診断)                   | rabbi : ユダヤ教の宗教的指導者             |
| radiation : 放射線治療                          | spouse : 配偶者                    |
| trek : 長く骨の折れる旅をする                         | tumor : 腫瘍                      |
| verify : 検証する                              | wedge : くさび, 不和を引き起こすもの         |
| zone out : 意識が遠のく                          |                                 |

- a. [ one / would likely / eye / the operation / blind in / leave Pete ]
- b. [ cause of / estimated to / errors / death / be the / are / third-leading ]
- c. [ circumstances / are beyond / many of / the underlying / their control ]
- d. [ precious in / developed / their / something / time together / simple yet ]
- e. [ or her / comfortable sharing / physician needs / to provide / feel / information his ]
- f. [ comfort / husband / also to / staff that / to / he / was a / Pete but / hospital / remind the ]

3

次の英文の( 1 )～( 8 )に入る最も適切な語を語群から選び、必要に応じて適切な形にして、書きなさい。(ただし、同じ語を2度以上使わないこと。)

Thirty-five years ago, when I started training as a neurosurgeon, you still had to take what was known as the ‘general Fellowship of the Royal College of Surgeons (FRCS).’ There was no ( 1 ) examination in neurosurgery, and instead you became a Fellow of the Royal College on the basis of an examination that was centered on ‘general’ surgery, which was mainly abdominal surgery. To qualify for the examination, I had to spend a year as a junior registrar in general surgery, which I did in a district hospital in the suburbs of outer London.

It was a busy job, working ‘three in seven’—meaning that I was on call in the hospital three nights a week and every third weekend, in addition to working a normal week. You were paid in *umtis* for work done over and above forty hours, an *umti* being a ‘unit of medical time’, a euphemism whereby four hours’ overtime was paid little more than one hour at the basic rate. I was operating most nights—( 2 )ing out fairly simple operations for appendicitis or draining abscesses—but usually got enough sleep on which to get by. There were two consultants, both helpful and supportive and good teachers, but—probably like most junior doctors at that time—I took considerable pride in trying not to ask for their help unless absolutely necessary. I therefore learned quickly, but still look back with deep shame and embarrassment at some of the mistakes I made, when I should have asked for help. At least none of my mistakes, as far I know, were lethal.

I have forgotten most of the patients I looked after during that year, just as I discovered in the Health Camp in Nepal that I have forgotten how to do the operations I did then. One patient, however, I remember very clearly, and even his name. He was a man in his fifties who turned up one evening with his wife in Casualty (as the Accident and Emergency departments were then called). He was smartly ( 3 ) in one of those fawn overcoats with a black velvet collar. He and his wife were perfectly polite, but quickly made me aware of the fact that he had previously been a private patient of one of my consultants. He had now ( 4 ) out of insurance and was back on the National Health Service (NHS). They looked very tense, and in retrospect I think they probably had a premonition of what the future might hold for him. He had developed increasing abdominal pain over the preceding two days. I asked him the usual questions about the pain: did it come and go in waves (‘colicky’ is the medical term), was he still able to pass gas, had he ‘opened his bowels’—that clumsy and absurd phrase doctors still use. Had he vomited?

“Yes. That started today,” he said with a grimace, “and it ( 5 ) horrible.” I noted silently that this was almost certainly feculent vomiting, a sure sign of intestinal obstruction. I asked him to undress and he ( 6 ) down on the trolley in the curtained cubicle.

His abdomen was criss-crossed with pale surgical scars and distended.

“I had an operation for colon cancer three years ago,” he said. “There were some problems afterwards and I was in hospital for many weeks and needed several more operations.”

“But then he was fine until two days ago,” his wife added, trying to find some grounds for hope. When I palpated—as doctors call examining by touch—his abdomen, I found that it was as tight as a drum. When I percussed it—pressing my left middle finger onto his stomach and then briskly tapping on it with my right middle finger—there was a deeply hollow sound. When I listened to his abdomen with a stethoscope, I could ( 7 ) the ‘tinkling, tympanitic’ bowel sounds characteristic of intestinal obstruction. He must have waited a long time at home, hoping and praying that the problem would go away.

Something was blocking his gut and the consequences of this are no different from the consequences of a blocked sewer. It is very painful, as the muscular intestines struggle to overcome the blockage.

“We’ll need to admit you,” I said, using the reassuring plural that can ( 8 ) doctors’ feelings of personal responsibility and vulnerability. “We’ll get some abdominal X-rays and probably pass a nasogastric tube and put up a drip.”

“Is it serious?” his wife asked.

“Well, hopefully it’s just post-operative scarring and it will sort itself out,” I replied.

[注]

|                                      |   |
|--------------------------------------|---|
| abdomen : 腹部                         | abdominal : 腹部の                               |
| appendicitis : 虫垂炎                   | blockage : 閉塞                                 |
| bowel : 腸                            | briskly : 勢いよく                                |
| clumsy : 分かりづらい                      | colicky : 痙痛 <sup>せんつう</sup>                  |
| colon : 大腸, 結腸                       | consultant : 顧問医, 指導医                         |
| criss-crossed : 十文字模様の               | cubicle : 仕切られた小部屋                            |
| distended : 膨張した                     | draining abscess : 膿瘍 <sup>のうよう</sup> を排出すること |
| drip : 点滴                            | euphemism : 婉曲表現                              |
| fawn : 淡黄褐色の                         | feculent : 糞便のような                             |
| grimace : しかめっ面                      | gut : 腸                                       |
| hollow : 空洞の                         | intestinal obstruction : 腸閉塞                  |
| intestine : 腸                        | lethal : 死を招く                                 |
| muscular : 筋肉の                       | nasogastric : 経鼻胃の                            |
| neurosurgeon : 脳神経外科医                | plural : 複数形                                  |
| preceding : 先行する, 前の                 | premonition : 予感                              |
| reassure : 安心させる                     | registrar : 研修医                               |
| retrospect : 回想, 追想                  | scar : 瘢痕, 傷跡 <sup>はんこん</sup>                 |
| sewer : 下水管                          | stethoscope : 聴診器                             |
| tinkling : 鈴の音のような                   | trolley : ストレッチャー                             |
| tympatric : 鼓腸の, 打つと太鼓のように鳴る         | vomit : 嘔吐 <sup>おうと</sup> する                  |
| velvet : ベルベット, ビロード                 |   |
| vulnerability : 脆弱性 <sup>ぜいじゃく</sup> |   |

[語 群]

|        |       |       |            |
|--------|-------|-------|------------|
| carry  | dress | hear  | lie        |
| reduce | run   | smell | specialize |



