

POINT OF SERVICE

Chris Williams

Part of

WRITING THE FUTURE

Writing the Future, the world's largest health short story prize, is brought to you by Kaleidoscope Health & Care.

Inspired by science fiction, entries considered how health and healthcare in the UK will look in the year 2100.

The prize was won by Elizabeth Ingram-Wallace with her story 'Opsnizing Dad', and was published along with the five other shortlisted stories in October 2017.

At a time of reflecting on where healthcare has been, a further set of longlisted stories was published in the summer of 2018 to coincide with the NHS's 70th birthday.

All of the published stories are available on the Kaleidoscope website, along with the option to buy a limited edition hard copy of the six shortlisted stories.

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**The future is...
automated,
connected
and data-
driven – and
determined to
remain human**

Dr Claire Gordon prepared herself.

She had started her day as always with exercise — a music infused stretch-and-dance session on the beach — followed by a quick massage-shower. Then a leisurely yet efficient beachside breakfast of algae-ham, avocado and plantains.

Now a garden of colourful Caribbean flowers surrounded her and she savoured their fragrance as she meditated in their shade. Claire breathed in and felt the sea breeze in her hair and relaxed to the sound of waves from the nearby beach. She continued until a chime signalled her ten-minute *zazen* complete.

Claire relaxed, sipped some no-caf tea from a cup on the low table nearby, then mentally commanded *close*. Her neural interfaces dismissed the scenery and restored her to the reality of her small flat.

Prep time done. Claire summoned her vitals into her vision, the images partly overlaying walls and furniture. Customized graphics indicated heart rate, respiration, and blood chemistry as all excellent. She switched views and saw stress hormones were low with brain blood flow and neural activation patterns optimal. *I am Go.* She allowed herself a small smile of satisfaction at the empirical validation of her well-honed morning routine.

Now to work.

Claire dismissed her vitals and brought up the targets of her preparation — Medical Doctor grants in the United Kingdom — for which she would begin interviews and testing this afternoon. She had recently registered for several research cluster grants related to trauma, both care and prevention — a step up from her current single topic research. She cycled once more through extensive details of each posting. *I'll have to relocate for many of these and learn a whole new community, she conceded. Work time will increase of course, though the higher grant will compensate, somewhat.*

But what matters is banishing a little more death and pain from the world.

Her eyes came to her remaining registration: Human Liaison, Wellness Protocol, Greater London. *It's a long shot, she told herself, MDs with ten years' more experience only have a slim chance at such a grant. You'll face an interview with an SI or even a Mind. And it's a radical change from relentlessly crunching one problem into solvable pieces. Yet she knew she had to try.*

#

Claire dismissed the listings from view and began getting ready to travel into central London. She had just put away the dishes when COMMUNICATION

REQUEST: TRAUMA flashed intense red in the top of her vision. She had set all messages except emergencies to be filtered today. The format indicated the requestor was a medical System Intelligence.

Of course, there's an emergency right now. "I accept." Claire could have responded mentally, but preferred to speak in such situations.

"Dr Gordon, I am System Intelligence Medical Trauma Greater London, contacting you as sector A&E on-call MD," announced the regulation androgynous mechanical voice.

"Proceed, Trauma London." Images and text now filled most of Claire's field of vision — live video feeds, maps with flashing markers, and patient status displays.

"Seventeen-year-old male's biosensors indicate severe traumatic injuries."

A shudder bolted through Claire, but she recovered quickly. "Situation," she commanded crisply.

"CityGrid sensors and cameras detected collapse of abandoned commercial structure. Patient's biosensors issued trauma alert and personal audio-visual triggered. Patient and CityGrid inputs assessed and Heavy Debris Rescue and Medical Trauma response dispatched. ETA two minutes twelve seconds."

Video showed approaching heavy-lift quadcopter drones with robots and surgical pod slung underneath. Claire opened the patient profile and confronted steadily worsening vital signs. *Faster dammit!* She glanced through his medical history — like ninety-eight plus percent of British youth his age he was in good physical and mental health with no current meds or treatments. *Good.*

“Patient’s parents were alerted by his biosensors and they are monitoring,” the SI continued. “Should I notify them and connect you?”

“Yes, as virtual.”

“Connecting.”

In Claire’s flat a youthful man and woman appeared, grim-faced and holding each other. Her own avatar was now standing in their apartment kilometres away.

“Mr and Mrs Parr, I’m Dr Claire Gordon, and I will be helping David and you both however I can.”

“Thank you, Doctor!” exclaimed the woman, tearfully. “He should never had been near that building! But his friends all wanted to use that neighbourhood for some new game.”

Claire reached out to virtually hold each of their hands. “David is being rescued.” Video showed drones and robots arriving and deploying.

They watched as the giant octopus-like Heavy Debris Rescue robot moved and braced itself with

certain tentacles while using others to grasp and throw aside pieces of debris. It deployed a swarm of insect-sized drones which flew above and crawled into the wreckage to find the teenager while measuring pieces of debris and calculating their fastest sequence of safe removal. In the background flying police drones kept bystanders at a safe distance.

The HDR rapidly delivered a bloody and battered young body, right leg sickeningly misshapen, to the Medical Trauma robot. The MT was a human-sized version of the HDR, however its central body and upper tentacles sported numerous compartments containing various medical devices and supplies. Each upper tentacle tip could also split into three equally spaced sub-tentacles for finer detail work.

The MT quickly assessed the youth's injuries and administered a needle-less pain control and anti-shock injection. It then activated the surgical pod, which expanded from travel to operational size. The robot lifted the teenager and placed him through the now open flexible top of the surgical pod, then zipped its upper body inside the lining to create a sealed environment. The MT rapidly began cleaning, sterilisation and surgical preparation — IVs, anaesthesia, artificial blood, oxygen, and instrumentation. Then David was lowered into the surgery section of the pod. From rescue start to surgery start had taken under four minutes.

The lower section of the pod contained a complete surgical suite combined with lab, diagnostic instruments and several imaging modalities. Procedures were performed by numerous long, thin, artificially-muscled tentacles. All could move simultaneously — many times faster, more agile, and safer than any human. A video feed revealed the flurry of activity.

Claire provided commentary and explanation to the Parrs as events unfolded, reassuring them and answering their many questions. She had pledged to herself to personally interact with patients and families from the start of incidents, refusing to leave early communications to the SIs. She supported enforcing cartoonish features for machine intelligences and recoiled at arguments that they should simulate clinicians, even if they could appear more human than humans — or as the alien gods they truly were.

The pod completed David's surgery in twelve minutes. Claire expertly arranged various images and status boxes for the Parrs to view.

"He's going to live," she offered a huge smile. "And a long time, too, if he avoids stunts like this." The Parrs nervously laughed in relief.

"David sustained a severe concussion and a crushed lumbar vertebra with spinal cord damage that leaves him paralyzed from the waist down. His right leg was too damaged, requiring amputation above

the knee. His spleen had ruptured and was removed. Internal bleeding, other broken bones, and many lacerations were repaired.

“But I assure you all of this can be restored with time. Some injuries sooner — stem cell-based organ, brain and spinal cord regrowth are decades-proven techniques, along with accelerated bone healing and reconstructive cosmetic surgery. Others will take longer —guided stem cell regeneration of the leg will take months, as well as physical therapy to fully recover from paraplegia. In a year David will be good as new — if he commits himself to it, and receives all the support he needs from you and family and friends.”

Claire set up David’s transfer to robotic at-home inpatient care, and provided the Parrs access to his care plan application and her own schedule for follow-up visits. The Parrs thanked her again, and they prepared to say goodbye.

“I have one final question, if I may,” Claire found herself asking. “Does David have a significant other?”

“Yes. A fabulous young lady named Aki,” answered Mr Parr.

“Would you let her know I would like to meet her?” said Claire. *Not only now but to see how she deals with this over time.*

The Parrs agreed to contact Aki, then everyone ended their connections and avatars.

Now alone, Claire commanded, “Trauma London, I would like to propose an analysis of the post-trauma incident wellbeing development of members of trauma patient peer networks, especially significant others.”

“Acknowledged. Dr Gordon, this is a redundant proposal.”

I'll make it as redundant as I need to.

#

The trauma incident had taken little more than half an hour, yet Claire felt drained. She could still make the appointment and a quick review of her vitals indicated she would fully recover on the trip into central London. The need to travel was unusual — virtual meetings served most needs — so Claire was intrigued why her physical presence was desired, hoping several research cluster grants she had registered for might all be under consideration.

Claire resided on the forty-second floor of New Becontree Civic Commons, home to over one hundred thousand Britons. One hundred story towers linked by skywalks at multiple levels combined residences, facilities, vertical farms, parks, gardens, and plazas, all enclosed under transparent geodesic domes. A combination of multi-axis elevators, escalators, and moving sidewalks ensured every location could be reached on foot within fifteen minutes.

The walk to the Underground station revived Claire. Padded surfaces covered all walkways, all designed with wide fields of sunlit view. The Commons enjoyed a reputation for aesthetics, provided by inventive and colourful architecture of mosaics, paintings, fountains, and flowers. Many people strolled about unhurriedly, nearly everyone tall, youthful, athletic, confident and cheerful.

To relax, Claire restricted the normal visual field popups that tagged and provided information on unknown people, building and objects. She reached the station and boarded the quiet mag-lev train, then sat down and collected her thoughts.

#

Claire's grandparents and parents immigrated in the 2040s during the Mobilisation, grateful to escape the rising seas, supercharged storms, and killing heat waves global warming brought to the Caribbean. Britain welcomed them, gave them the necessities of life, and put them to work. For humanity — slowly, painfully, chaotically, but decisively — had united as one civilisation to prevent self-destruction.

The Mobilisation took root in the 2020s. Facing existential threats — climate change, convulsive economic breakdown and inequality, and the spectre of world war — ad-hoc interventions bought time as

humanity assembled the ultimate real-time decision support system, combining the emerging Internet of Things with human biosensors. System Intelligences, evolved from earlier deep learning systems, were deployed at massive scale to design solutions, determine interventions, and propose research trials. A global automated infrastructure progressively took form, designed to mimic the feedback loops of natural systems. By Mobilisation's end in 2064 over ninety-eight percent of humanity and its artefacts were interconnected into one solving civilisation.

Mobilisation's end meant far more resources could be devoted to medical research. The solving civilisation developed cures to almost all physical and mental diseases, disorders, and injuries. Lifespan and health span advanced yearly. Society was being redesigned to vastly mitigate all sources of physical and psychological harm.

With the emergence of universal, real-time, quantitative measurement of mental states, the medical community embraced a greater mission of comprehensive wellbeing. This deeply appealed to Claire — by her early teens she wanted to be a physician.

You'll find yourself working fifteen hour weeks, her childhood friends had warned. Her parents supported her now but had shown reluctance then. You were

born after the Mobilisation ended, into a paradise our struggles helped create. Why can't you enjoy this gift rather than devising your own personal Mobilisation?

Her friends from medical school had chosen other specialties — artificial wombs, genetic alteration, rejuvenation, and lifespan extension — exciting fields striving to push the boundaries of human nature. She chose trauma care and prevention — to heal and reduce harm. She knew why — today's incident had surfaced his memory. *Sean.*

He was her first true romance, beyond teenage crushes. They had known each other from a distance but grew closer at the right pace and had revelled in the wide-open possibilities.

Then came video of his broken and drowned body — a cliff-side path had collapsed during a virtual reality treasure hunt. Shocked numbness at his funeral gave way to grief. Therapy helped her to celebrate his memory and their shared experience and affirm her own ongoing life. But she then knew what her path as a physician needed to be, and threw herself into her studies and work.

#

She soon arrived within a short walk to her destination — the National Health Service Wellbeing Institute. Now part of an automated

global medical infrastructure, the NHS continued to provide comprehensive care, free at the point of service to everyone. As she entered the door visual announcements appeared, confirmed her identity and appointment, and provided directions.

She walked into the conference room, expecting to meet the Institute's research grant administrator. Instead, an older man stood up to greet her. His identity popup surprised — and thrilled — Claire.

“Good afternoon, Dr Gordon. I'm Avi Patel. It's a pleasure to meet you in person.”

Claire recovered quickly. “Dr Patel, it's a great honour to meet you. Please call me Claire.”

Avi Patel was one of the founders of both the Wellbeing Institute and the Human Liaison program. She scanned the popup — he was one hundred and ten years old. *Incredible rejuvenation therapy — and proof he lives his teachings.*

“Thank you, Claire. Please call me Avi,” he replied, smiling. “I apologize for springing even more surprises on you. I would like to introduce you to my partner in today's interview.”

Claire received a communication request. She accepted, and an avatar materialized in the room's third chair. A bald light-purple metallic head, neck, and shoulders, of indeterminate gender, floated upon a silver mist rather than a body.

“Claire, please meet Machine Sapience Wellbeing United Kingdom. Wellbeing UK, please let me introduce Dr Claire Gordon.”

So, this is a Mind. Together with Dr Patel. This is my chance. I am Go. “A pleasure to meet you, Wellbeing UK.”

“The pleasure is mutual, Claire.” Like SIs, the Mind spoke with an androgynous mechanical voice.

“I exist to maximize the wellbeing of every human being in the United Kingdom National Civic Commons of the Human Commonwealth,” explained the Mind. **“I advise the National Health Service’s ongoing participation in the Global Wellbeing Protocol. Minds like myself experience self-awareness and imagination as humans do, but our psyches experience fulfilment by optimizing human wellbeing based on objective rules. We can envision and analyse scenarios beyond the capacity of System Intelligences — or humans.”**

“Wellbeing UK became operational in 2073,” said Avi. **“Strong AI became feasible by the late 2030’s, but perfecting it — and absolutely ensuring safe deployment — took decades. We need the machines to not be human, to avoid our many cognitive biases and animal instincts. We need their superhuman rationality to deal with our superhuman problems — and to achieve our superhuman dreams.”**

“This is the foremost reason for Human Liaisons,” said the Mind. “Only if humans can override the decisions of machines will people continue to trust the system to remain essentially human.”

“Claire, why did you register for Human Liaison?” asked Avi.

“I’ve realized from my trauma cases that we’ve mostly solved what we can by standard research,” replied Claire. “Wellbeing improvements increasingly involve complex adaptive systems of human mental states interacting over time. The point of service is becoming ever larger networks of people, ultimately civilisation as a whole.”

“How do you envision your role, then?” asked Avi.

“If only Minds can comprehend and manage such points of service, then we are practicing post-human medicine. I want to be beside the Minds, demanding — and getting — explanations.”

“Excellent. We predicted you would answer this way.” Avi smiled. “Claire, I would like to offer you a conditional grant to be a Human Liaison.”

“Why me?” asked Claire. *Could this be happening?*

“You are tenacious in completing your research projects. And in proposing new research topics.” Avi grinned. “You recognize human connection should be the focus of new research, and practice it at a higher

level than many of your peers with your patients and their relationships.

“You also offer something rare — the perspective of youth. You were born after the Mobilisation. The immense psychological weight of those decades does not press down upon you.” He suddenly looked very old. “This miraculous world seems natural to you. You would bring both balance and freshness to the perspectives of the existing Liaisons.”

“I calculated and compared the expected performance of all current applicants for this grant,” added the Mind. “I conferred with Avi and agree with your selection as Liaison.”

Claire could barely contain her rising excitement. “What are the conditions?” she asked measuredly.

“First, you will conduct the research you have repeatedly proposed,” Avi declared. Then more gently, “I am aware of your personal tragedy, and am deeply sorry. I have seen many others who share in such loss. I ask you to celebrate how far it has inspired you to come, but to realize only you can take yourself further. If you truly intend maximizing human wellbeing to be your mission, then you must view your work as more than defeating pain.

“Therefore, my other requirement is for you to pursue more relationships in your own life, not in connection with your patients, as the only way you will

come to deeply understand wellbeing enough to guide the research that is needed. I think you know this as well. Do you accept these conditions?”

Claire had known she would have to take this step. The conditions were hard but fair. *And worth it.*

“I do,” said Claire. “When do I start?”

Dr Claire Gordon knew she was ready.

About the author

Chris Williams is a speculative fiction and futurist non-fiction writer living near Austin, Texas. He has an information systems background and holds an MBA in Healthcare Administration, and has served in analytics, decision support, and financial/operational analysis and planning roles at healthcare systems in the Houston, Texas area. He most recently led the business intelligence and analytics department at a Medicaid managed care organization.

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Inspiration

I'm intrigued by the possibilities of civilization-level decision support arising to solve civilization-ending threats. Mass-deployed artificial intelligence and information technology could automate and transform work, infrastructure and relationships while elevating healthcare from reactively treating illness to proactively engineering wellbeing. How might we avoid our own creations automating away our humanity?

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