



The chapel ward of No 10 Stationary Hospital, as shown in the *Illustrated London News*, 6 May 1916

# No 10 Stationary Hospital and the chapel ward at Saint-Omer, France, 1914-18

The illustration of patients and staff in a military ward during the first world war is a poignant reminder of the role of doctors and nurses in modern war zones, says **Peter Wever**

**Saint-Omer was bombed frequently and severely, with narrow escapes for the hospital and its staff**

**O**n 6 May 1916 a drawing appeared in the popular weekly magazine the *Illustrated London News* with the caption, “The British hospital in the old St Joseph College at Saint-Omer: in the chapel.” The darkness of the scene is accentuated by a few bright electric lights above the heads of seemingly sleepless patients, cared for by two night sisters. The image of Jesus in the central leaded glass window, which provided comfort during the day, has disappeared with the night.

The scene depicts the chapel ward of No 10 Stationary Hospital at Saint-Omer in northern France during the first world war. The chapel was part of the Pensionnat Saint Joseph, a boarding school in the Rue Edouard Devaux, which was erected in 1729 by the Frères des Écoles Chrétiennes (Brothers of the Christian Schools).<sup>1</sup> The illustration was drawn on the site by the Barcelona born, internationally renowned magazine illustrator José Simont Guillén (1875-1968), who signed his works J Simont.<sup>2,3</sup>

## Disrepair and decay

In October 1914 the Royal Army Medical Corps (RAMC) had taken

over the Pensionnat Saint Joseph, which the French army was using as a temporary military hospital. Major Frank A Symons described the boarding school in his 1917 book *Tale of a Casualty Clearing Station* as “a huge three-storied edifice, one side on a cobbled street and the other looking out upon a large enclosure garnished by trees . . . one wing was in hopeless disrepair and decay. There was, however, an enormous kitchen, good offices, a splendid room for an operating theatre, a small mess-room, and three enormous dormitories, already equipped with fifty bedsteads each.”

Its chapel was described as ruined, cold, and dank, useless except for storage. Shortly after publication Symons, by then a colonel, was killed in action aged 48 at Arras, France.<sup>4,5</sup>

Towards the end of October 1914, No 10 Stationary Hospital took over the boarding school with the chapel still in a reportedly dilapidated condition.<sup>1</sup>

Yet, in a letter dated 9 December 1914, Sister Edith E Appleton

wrote home to her mother that the chaplain had reopened the chapel, describing it as a pretty little place with beautiful stained windows.

Soon, the chapel—by then well ventilated, heated, and lit by electric light—came to be used as a ward with 50 beds, primarily for patients with head injuries.<sup>1</sup> Indeed, in the foreground of Simont’s illustration, a wounded soldier can be seen with a bandage around his head.

## Bombing of the hospital

No 10 Stationary Hospital was able to accommodate about 1000 patients and was fully equipped with an operating theatre, x ray facilities, and a dental department, alongside a separate officers’ hospital.<sup>1</sup> During the night of 2 September 1917, German bombs fell in front of the officers’ hospital, killing some of the admitted officers and breaking all of the windows.<sup>7</sup> In the following months Saint-Omer was bombed frequently and severely, with narrow escapes for the hospital and its staff.<sup>8</sup>

During the night of 22 May 1918,<sup>9</sup> No 10 Stationary Hospital received direct hits in a German air raid on Saint-Omer (other sources date





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this as 21-22 May).<sup>10,11</sup> That night Beatrice Hopkinson, a nurse awaiting further orders, was temporarily staying at a hostel for sisters at No 10. She described the events in her diary: “Feeling very tired, we retired early, but we had only been in bed what seemed a few moments when ‘whirr, whirr,’ we heard enemy planes overhead.

“Immediately the bell from the ruins of Eglise St Bertin commenced its mournful toll and, as [if] by magic, every light was extinguished. We thought Jerry [nickname for German soldiers] must have gone off in another direction as we could not hear the machines and everything was so deadly still; when ‘whirr, whirr, bang, bang, bang, bang,’ four bombs dropped in quick succession.

“Hastily snatching our blankets off our beds, we quickly wended our way in the darkness to the cellars... For an hour we stayed in that damp place, shivering and aching all over... About midnight we heard the doorbell clang.

“We put our heads through the window and saw it was the night sergeant from the hospital asking for matron... Soon matron came and we overheard him say, ‘Matron, those four bombs fell on the hospital, killing and wounding a great many.’ None of the sisters were wounded, fortunately, so all were busy doing what they could for those bombed, already bombed, patients.”<sup>11</sup>

**Gallantry, devotion to duty, and courage**  
During the hours that followed, several

members of No 10’s nursing staff distinguished themselves through gallantry, devotion to duty, and courage. Sister Charlotte L A Robinson entered the ruins to help recover patients buried in the debris, her one thought being their rescue. While on night duty Nellie Galvin, acting sister, remained in the ward attending to sick patients, several of whom were wounded, and carried on her work as if nothing had happened.

The ward in which acting sister Minnie M de Guerin was on night duty had been cut in two, but she remained on duty, attending to the wounded and helping to rescue buried people from the debris of the destroyed building. Staff nurse Katherine R Lowe continued to carry out her duties and showed much resourcefulness in looking after injured people while a large portion of the ward in which she was on night duty had been destroyed.<sup>12</sup>

For their bravery these four women were awarded the Military Medal on 26 June 1918.<sup>12,13</sup> A short film with images from this ceremony can be seen online.<sup>14</sup> During the first world war some 115 600 Military Medals were awarded, but only 122 were given to female nursing staff.<sup>14</sup> After the war acting sister Galvin was also invited to meet King George V at Buckingham Palace.<sup>15</sup>

### Hospital victims

The morning after the air raid Nurse Hopkinson went to No 10 Stationary Hospital to see what damage had been done: “Arriving at the hospital, we saw terrible destruction. The bombs had hit two top wards and cellars below, taking beds with their patients and all kinds of ward equipment with them; killing and wounding not only the patients who had not been able to get out of bed, but [also] those patients who had gone

down to the cellars for their supposed safety.”<sup>11</sup>

In the afternoon the British matron in chief, Maud McCarthy, found everyone busy evacuating patients. The number of casualties was considered remarkably small, considering the amount of damage.<sup>8</sup> Four wards had been completely destroyed and 17 patients killed (although another source mentions four patients killed).<sup>9,10</sup>

Besides the patient casualties, nine RAMC men died in the air raid:

- Captain Edward J Elliot, 37
- Captain Thomas Mohan, 33
- Sergeant Gordon L Dell, 23
- Lance corporal Harry Farley, 38
- Private Frank Morley, 21
- Private Thomas Bullmore, 28
- Private John Smith, 30
- Private Tom H Orton, 22
- Private Samuel Parrin, 42.

The listed date of death of all nine men is 23 May 1918. They are buried alongside each other at Longuenesse (St Omer) Souvenir Cemetery [grave references: plot 5, row B, graves 29-34].<sup>16-19</sup> This cemetery provides a final resting place for more than 3000 casualties of the first world war, including six nurses and 60 RAMC men.

After the destruction of the Pensionnat Saint Joseph, No 10 Stationary Hospital was transferred to a safer location at Clerques,<sup>10</sup> some 20 km west of Saint-Omer. Some smaller buildings of the original boarding school still stand today at the northeast corner and north side of the inner court. Nothing remains of the chapel ward.

Hospitals in war zones are currently protected under the Fourth Geneva Convention of 1949. Yet, while the world commemorates the centenary of the “war to end all wars,” hospitals remain targets of air raids, as recently illustrated by attacks on Kunduz Trauma Centre in Afghanistan, operated by Doctors Without Borders (3 October 2015); al-Quds Hospital in Aleppo, Syria, supported by Doctors Without Borders and the International Committee of the Red Cross (27 April 2016); and a hospital in Abs District, Yemen, supported by Doctors Without Borders and Unicef (15 August 2016).

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**Charlotte Robinson, Nellie Galvin Minnie de Guerin, and Katherine Lowe receive their Military Medals**

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Longuenesse cemetery, resting place of the nine RAMC victims



# Cognitive lessons from the cold war

The US/USSR nuclear standoff may help doctors reduce diagnostic error, say **Valerie Vaughn and colleagues**

**F**rom the 1940s to the 1990s the United States and the former Soviet Union (USSR) confronted each other in a cold war. Each side feared and distrusted the other. Each side was prepared to respond to an attack with immediate nuclear retaliation.

Although this stance of “mutually assured destruction” helped to avoid total war, the cold war threatened to turn hot on several occasions, most notably in the autumn of 1983. The USSR then interpreted “Able Archer,” a benign, routine Nato exercise, as cover for an impending first strike. The US compounded the error by failing to recognise Soviet fears and continued the military activities, pushing USSR leaders close to a pre-emptive first strike and catastrophic nuclear war. A report from the US President’s Foreign Intelligence Advisory Board, completed in 1990 but declassified in 2015, shows that the US had ample information to identify Soviet fears and pursue a calming course but failed to do so.

Here we explore the parallels between this near catastrophe and medical diagnostic errors.

## Intelligence analysts and doctors

Both intelligence analysis and medical practitioners must make sense of information using perception, cognition, theory, and emotional and social intelligence to construct a coherent account of the world.<sup>2</sup> Both groups use data that are sometimes clear, frequently shifting, often contradictory, and always incomplete to inform many decisions made quickly in a dynamic environment—all with the expectation of solving a problem that may be ill defined. Analytical mistakes have serious consequences for nations and patients alike. Errors made by intelligence analysts may lead to war. Errors made by doctors may lead to unnecessary patient testing, treatment, or harm.<sup>3</sup>

Doctors make diagnostic errors in 10-15% of cases, an estimate that has stayed constant for nearly 20 years.<sup>3-5</sup> Doctors’ bad decisions can often be traced to cognitive biases. Medical error rarely involves a single mistake,<sup>6-9</sup> and Able Archer was similarly complex (table).

## How cognitive bias almost led to war

Premature closure was the first cause of the Able Archer mistake, occurring on both sides of the battlefield. The Soviets were already on edge; earlier in 1983 President Ronald Reagan had described them as an “evil empire” and announced plans to deploy a new missile system in Europe that could reach Soviet command and control facilities in just 5 to 6 minutes.

Able Archer included US warplanes being loaded with realistic looking dummy warheads, radio communications that mimicked preparations for a first strike, and a radio silent airlift of 19 000 soldiers on 170 flights to Europe. These combined data led the Soviets to conclude that Nato was preparing to launch a first strike under cover of a military exercise.<sup>10</sup> The Kremlin leaders thought their only hope of survival was to strike first.

US analysts “anchored” on the increasingly heated speeches coming from behind the Iron Curtain. They failed to adequately consider that this fear might be genuine in light of new information showing that they were responding abnormally to US military exercises—changing the readiness of their intelligence agencies, shifting their economy to wartime footing, and moving nuclear capable bombers closer to Nato forces. Even after the British ambassador tried to convince US officials that the Kremlin’s fear was authentic, US intelligence failed to change



**President Ronald Reagan had called the Soviet Union the “evil empire”**

## KEY MESSAGES

- To make sense of incomplete data, military intelligence analysis and medical diagnosis share similar tasks
- Both are subject to similar biases and cognitive processes—specifically, premature closure, anchoring, availability bias, and over-reliance on technology.
- Lessons learnt from the mistakes made around Able Archer can teach us to prevent medical errors
- We should use a team based approach to differential diagnoses, worst case scenarios, and future indicators to reduce the risk of cognitive bias

Cognitive biases in Able Archer and medicine		
Cognitive bias	Able Archer	Medicine
<b>Premature closure</b> Failure to consider reasonable alternatives after making an initial diagnosis	The US intelligence community determined quickly and early that “Moscow was not concerned about any hypothetical near term US nuclear attack” <sup>1</sup>	A doctor quickly diagnoses pneumonia but fails to ask questions to enlarge the differential diagnosis
<b>Anchoring</b> Tendency to place too much weight on the first information obtained or first conclusion reached	The US saw an escalation in broadcast propaganda as evidence that the whole scare was propaganda, and weighed this evidence above new information	A doctor emphasises “a patient’s presenting symptom (eg, fatigue) in differential diagnosis, rather than the more serious symptoms (eg, chest pain) reported later
<b>Confirmation bias</b> The tendency to search for, favour, and recall information that confirms pre-existing hypotheses; giving disproportionately less consideration to alternatives	The US explained away facts inconsistent with its first interpretation and failed to subject that interpretation to new assessment	An elevated white blood cell count is emphasised in the diagnosis of pneumonia; the elevated brain natriuretic peptide is discounted
<b>Availability bias</b> A mental shortcut that relies on immediate examples or past experiences	The USSR’s failure to perceive the Nazi threat before the second world war led them to overemphasise that experience when evaluating the NATO threat	A patient who presented with fever and dyspnoea had a pulmonary embolus. The doctor now does the same examination in all similar patients
<b>Automation bias</b> Over-reliance on technology. The propensity to favour suggestions from automated decision making systems and to ignore contradictory information made without automation	USSR reliance on the RYAN computer program to determine the probability of a successful US attack, despite it being unvalidated and based on erroneous assumptions	A doctor puts too much weight on a computerised risk model even when the model does not account for important atypical information
<b>Status quo bias</b> The tendency to assume that things stay relatively the same	“Despite indications of increased readiness with some units, other units upon which no positive intelligence existed regarding readiness were assumed to have not increased readiness” <sup>1</sup>	A doctor assumes blood creatinine level is unchanged when considering intravenous contrast for CT despite the patient’s recent fall in urine output

their diagnosis and advise the officers in charge of Able Archer to modify previously planned activities.

Soviet leaders were also affected by availability bias. They had memories of June 1941, when Russia had failed to appreciate the reality of the Nazi threat. They did not want to make the same mistake again.

This series of mistakes could have led the USSR to start a nuclear war. In the end, a frontline Nato officer acted “out of instinct, not informed guidance” and Able Archer became a near miss not the end of the world.<sup>1</sup>

### Lessons from Able Archer

The board recommended comparative risk assessments, which assign two kinds of weights to each scenario—one that estimates the probability that the scenario is correct and one that assesses the risk to the US if it wrongly rejects a scenario that is correct.<sup>1</sup> The board emphasised a systematic, team approach, with multiple opinions and assessors to avoid premature closure.<sup>1</sup>

### Applying these lessons to medicine

#### Warning against cognitive bias

In the years after Able Archer psychologists developed the concept of dual process reasoning to explain the cognitive processes by which decisions are made.<sup>11</sup> The first pathway (system 1 thinking) is fast, intuitive, and relies on pattern recognition to make split second, emergency decisions. It invokes the “act first, think later” part of our mind that works well when faced with a crashing patient or classic disease presentation. Because this processing requires less cognitive load and takes less time, it is often the default pathway. When practised by experts, this intuition reflects years of experience in repeated

pattern recognition and offers many adaptive advantages, as long as cues and environments are stable.<sup>12</sup>

The second pathway (system 2 thinking) is slower, more deliberate, and analytical, systematically integrating new information with previous knowledge. It invokes the “this doesn’t make sense; what am I missing?” component of decision making. Although the fast pathway may arrive at the correct conclusion, it is subject to error, especially in low certainty situations or when feedback delay occurs and outcomes are not immediately apparent.<sup>12-14</sup>

Diagnostic reasoning also occurs through these two pathways, and efforts to shift thinking from fast to slow might be valuable for preventing medical errors.<sup>15</sup> Knowing when to switch between systems 1 and 2 may be the key.<sup>16</sup>

Unlike intelligence analysts facing an impending threat, the human mind has no built in warning system to signal danger. Instead, recognising a knowledge gap may be important.

#### Comparative risk assessments

Clinicians could benefit from recognising that diagnosis is dynamic and that the likelihood of various conditions must be recalibrated in accordance with new information.

Providing future indicators for clinician hand-offs, in particular, might prove useful. A list of indicators that would influence suspicion of a certain illness (for example, positive d-dimer results) or dictate specific actions to be taken by the covering team (such as, imaging for pulmonary embolism) could be handed over. These should be updated as decisions are made and new information becomes available.

### Team approach

Focusing on a systematic, team approach would enable all of the recommendations to be combined. Doctors often find it difficult to slow down, so a discrete mechanism to stimulate a shift towards system 2 reasoning should be considered.

One approach might be the use of diagnostic boards or time-out sessions where medical professionals from diverse disciplines come together to perform comparative risk assessments.<sup>17</sup> Discussion may focus on presentations associated with serious errors, such as chest pain or shortness of breath, or be tailored to diagnostic conundrums. This process would also ameliorate the sociological dangers of a single voice commandeering the process.

### Conclusion

In this era of copious data, fragmented care, and ever increasing time pressures, the risk of diagnostic error has never been greater. Intelligence analysts and medical practitioners may live in different worlds, and play different high stake “games,” but they share many of the same diagnostic processes, biases, and challenges. Lessons from war may improve processes in medicine. They may be closer than we think.

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I first coughed up blood in 1945 when I was working as a 22 year old sanitary inspector in the RAF in southern Italy, and I feared tuberculosis as I had just seen a colour film featuring Chopin coughing blood on his keyboard.

I was examined, x rayed, and told I was all clear. But they missed the high cavity in my lung, and in April 1946, when just about to take up a dream post as hygiene inspector for the whole of RAF Middle East Command, I collapsed in Heliopolis transit camp producing cupfuls of blood. "Hello," I thought, "something is wrong," and, thanks to tuberculosis, that was the end of my RAF career.

I was taken by hospital train to the British Military Hospital in Jerusalem, where they tried an artificial pneumothorax, which didn't work. There followed bed rest for nearly a year in a ward of bored and badly behaved young men. This was the time of Zionist attacks against the British: we heard the bombing of the King David Hotel in July 1946, and when we were evacuated to England in 1947 it was under armed guard. I remember being carried down the gangplank in Southampton on a stretcher looking desperately ill, but I had so much of other people's contraband stashed around me under the blankets that the orderlies had trouble carrying me.

In summer 1947 I was transferred from St Athan in Cardiff to the King Edward VII Sanatorium in Midhurst, Sussex—I had a carriage all to myself because I was classified as infectious, and, when changing trains, I was dumped on a stretcher in the middle of a platform while the two orderlies went for tea.

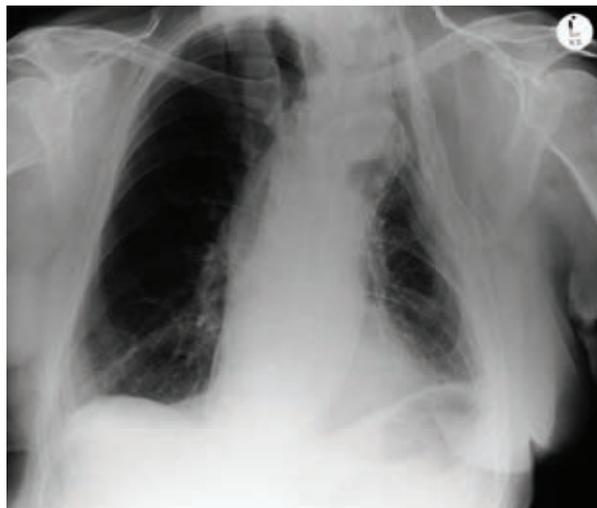
I was due for a thoracoplasty—a rather horrifying procedure in which some of my ribs were removed and my shoulder blade slid inside the remaining ribs to keep my lung from being permanently crushed. The

## Alive for 68 years: a record breaking thoracoplasty?

Radical treatment for tuberculosis in 1947 saved **Eddie Spiegelhalter's** life



Eddie Spiegelhalter in 1945



A recent x ray of the mess inside Eddie's chest caused some amusement among junior doctors

Australian surgeon was excellent, although I unfortunately cannot remember his name.

It took three sessions altogether, with around a week in between to recover. The first two stages were under local anaesthetic only, and I remember the injections in my back while lying face down, and I could hear the bones being crunched and my ribs being dropped into a bucket. The third stage was done from the front, and I was relieved to get a general anaesthetic so there was no risk of seeing what was going on. The nightly morphia injection was a great relief.

Back in Cardiff, I recovered slowly. After many months, I was allowed out for an afternoon but found myself terrified of traffic after being institutionalised for two years. I did not see my daughter until she was 20 months old, but finally got home and started work in June 1948.

I started with a 100% war disability pension, but this was gradually reduced to 30%, and it's been a useful tax-free bonus for 68 years. Coincidentally, my father also survived lung damage—he was gassed near Passchendaele in early 1918 but lived until he was 81.

I've been remarkably lucky with my health, although when I recently had a chest x ray (figure below) the junior doctors were rather amazed at the mess inside my chest. Now at 93, I manage to live on my own with some daily help—my main problem in old age has been shortness of breath, which I suppose I should not find surprising.

I've searched the internet but cannot find any mention of anyone living so long after this operation. So I wonder if I am the longest surviving thoracoplasty?

Eddie Spiegelhalter\* (as told to David Spiegelhalter)

Thanks to Drs Peter Reeves and Alexander Werren of North Devon District Hospital for provision of the x ray.

\*Eddie Spiegelhalter died on 11 August 2016, after the submission of this article. His death certificate made no mention of his lungs.

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