Medical Cases Adjudicated by the Transportation Appeal Tribunal of Canada: 2000–2018

Christopher Brooks; Conor MacDonald

INTRODUCTION: In Canada, aviators and seafarers are required to be medically fit by international and domestic standards to be issued a medical certificate by Transport Canada (TC). In the event of denial or restriction, individuals have the right to a review by an independent decision-maker with medical expertise/training in marine and/or aviation medicine. This paper presents the results of cases submitted to the Transportation Appeal Tribunal of Canada over 19 yr.

METHODS: The Tribunal's repository of medical records was searched and 112 adjudicated cases were reviewed.

RESULTS: Since 2000, 55 (49%) cases were in the aviation sector and, since 2010, 57 (51%) cases were in the marine sector. The mean age of applicants was 49 and 54 yr for seafarers and pilots, respectively. Mental illness, cardiovascular disease, visual, and neurological disease were the most common reasons for a medical certificate restriction/denial. The Tribunal upheld the refusal to issue or renew a medical certificate in 89 (79%) cases and 23 (21%) cases were referred back to TC.

CONCLUSIONS: Mental illness is the most frequent diagnosis that precipitates a request. The international literature is sparse on the number, causes, and results of the appeal process. Our findings and the application of the medical standards in Canada are generally comparable with those of the United Kingdom. It was not possible to make more than indirect comparisons to those of the United States.

KEYWORDS: mental illness, aviation, marine, safety, medical review.

Brooks C, MacDonald C. *Medical cases adjudicated by the Transportation Appeal Tribunal of Canada: 2000–2018*. Aerosp Med Hum Perform. 2020; 91(2):79–85.

All aviators require medical certification of fitness to fly and all commercial seafarers involved in the operation of vessels require medical certification to sail. In Canada, the legal framework for these requirements is built around related provisions in the Aeronautics Act,[1] the Canada Shipping Act (2001),[4] their respective regulations,[3,4] and the international medical standards from the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).[9,10] In addition, Transport Canada (TC), as the national regulator, sets policies and guidelines based on the legislation and standards.[13,14]

The process for obtaining an aviation or marine medical certificate starts with the aviator or seafarer (here referred to as the applicant) being examined by an aviation or marine medical examiner (AME or MME). This physician, trained and approved by TC, is designated with the responsibility to assesses whether the applicant meets the medical fitness criteria to work in the air or marine environment, usually in a safety-critical position. The medical examiner produces a medical examination report to TC. If all appears well, the applicant is issued a provisional medical certificate of fitness. The designated physician is an advocate for public safety, but has been trained by TC to balance the decision, taking into consideration the wellness of the patient too.

Based on the results of the examination report, TC has three options: 1) refuse to issue a medical certificate; 2) issue a medical certificate with restrictions; or 3) issue an unrestricted certificate. The Transportation Appeal Tribunal of Canada (TATC or Tribunal) and, prior to 2003, its predecessor, the Civil Aviation Tribunal, provides a recourse mechanism following the Minister of Transport's decision to cancel or refuse to renew, issue, or amend a medical certificate. If an aviator or seafarer is denied a medical certificate, or does not agree with a specific

From the Transportation Appeal Tribunal of Canada, Ottawa, Ontario, Canada.

This manuscript was received for review in August 2019. It was accepted for publication in November 2019.

Address correspondence to: Chris Brooks, M.B.Ch.B., D.Av.Med., 16 Kinmount Pvt, Kanata, ON K2T 1K2, Canada; dr.chrisbrooks@rogers.com.

DOI: https://doi.org/10.3357/AMHP.5489.2020

limitation imposed by TC, they can request a review hearing of the Minister's decision from the TATC, conducted by an administrative judge who is an impartial and independent adjudicator. The Tribunal adjudicators who have heard the cases for this study were highly experienced physicians with backgrounds in aviation and marine occupational medicine. They are required to pass a series of examinations and a rigorous selection process to become members of the Tribunal, and they receive specialized training in the adjudication process once appointed as members by the Governor in Council. Once notified that the aviator or seafarer wishes to have a review of their case, the Tribunal schedules a convenient time and venue for the parties to convene.

There are two levels of adjudication at the TATC. The first is the review of the Minister's decision, which is heard by a single physician member at a review hearing. During this hearing, the parties have the opportunity to present arguments and evidence that supports their position. Once all the information is gathered, the member analyzes it and renders a determination. The member can uphold TC's decision, or disagree with the decision and refer the file back to the Minister for reconsideration.

If the aviator or seafarer disagrees with the member's determination, they have 30 d to file a request for an appeal with the Tribunal. At the second level of adjudication, an appeal hearing is then scheduled and a three-member panel of adjudicators from the Tribunal hears the case. The panel comprises a physician member other than the member who conducted the review, another with an occupational background similar to that of the aviator or seafarer, and one member with a legal background. If the aviator or seafarer (at this level referred to as the appellant) disagrees with the outcome of the appeal, he/she can apply to the Federal Court of Canada for a judicial review. The judicial review of a Tribunal medical case by the Federal Court has only happened once. In this particular case, the Court agreed with the original TC decision, which had been upheld by the Tribunal at both the review and appeal levels.

In the aviation and marine sectors, the safety of the individual, the crew, the passengers, the cargo, the aircraft or vessel, and the general public are of primary importance. Approval or disqualification of medical certification is decided on the basis of how a candidate's condition may impact the safety of the operation of the aircraft or vessel. When the TATC replaced the former Civil Aviation Tribunal in 2003, it acquired new jurisdiction in other transportation sectors such as marine. To date, there has been no retrospective and comprehensive review concerning the types of diagnoses in the cases brought by aviators and seafarers, or the reasons for refusal or modification of a medical certificate. In its annual report, the Tribunal, for privacy reasons, publishes only the number and outcomes, but no diagnoses or analyses of the cases it adjudicates. The number of medical certifications granted or denied by TC each year is not publicly available. It is estimated, however, that there have been thousands of decisions made by TC that are accepted by the aviator or seafarer and not challenged before the Tribunal. With the approval of the Chairperson of the Transportation Appeal Tribunal of Canada, this paper analyzes the data available from the cases adjudicated by the Tribunal where TC's decision has been contested.

METHODS

The records of all medical hearings conducted by the TATC and the Civil Aviation Tribunal since 2000, up to and including 2018, were analyzed. The TATC hearing protocol has remained consistent and unchanged over this time. Key data extracted consisted of basic information such as age, gender, and profession of the applicant/appellant; date of request for a hearing; when the case was heard; and the type of case, such as a review or appeal hearing precipitated by a refusal to issue, amend a restriction, or renew a medical certificate. The primary medical condition in each case was noted, as well as the legal framework applied (aviation or marine), and the statistical data was analyzed to determine if there was any sudden change in the number of cases concerning a specific illness. Finally, it was noted how many of the Minister's decisions were upheld by the Tribunal, or referred back to the Minister for reconsideration. The data was collected and reported with complete anonymity. It was then compared to the data available, albeit very limited, from equivalent international bodies that conduct appeals for aviators and seafarers in other countries.

RESULTS

Since 2000, there have been a total of 112 medical hearings in the aviation and marine sectors (**Table I**). All but two cases were male applicants (98%). There were marginally more marine cases ($N = 57$) than aviation ($N = 55$); however, the seafarer data only started in 2010, while aviator data analyzed was taken

Table I. Aviation and Marine Medical Hearings Held Between 2000 and 2018 Inclusively.

	MARINE		AVIATION		COMBINED	
YEAR OF ANALYSIS	#	%	#	%	#	%
2000	0	0%	8	15%	8	7%
2001	0	0%	5	9%	5	4%
2002	0	0%	2	4%	2	2%
2003	0	0%	0	0%	0	0%
2004	0	0%	1	2%	1	1%
2005	0	0%	2	4%	2	2%
2006	0	0%	4	7%	4	4%
2007	0	0%	1	2%	1	1%
2008	0	0%	3	5%	3	3%
2009	0	0%	1	2%	1	1%
2010	2	4%	0	0%	2	2%
2011	4	7%	0	0%	4	4%
2012	4	7%	2	4%	6	5%
2013	7	12%	3	5%	10	9%
2014	13	23%	1	2%	14	13%
2015	9	16%	4	7%	13	12%
2016	5	9%	6	11%	11	10%
2017	5	9%	6	11%	11	10%
2018	8	14%	6	11%	14	13%
TOTAL	57	100%	55	100%	112	100%

from 2000 onward. As a result, when accounting for the difference in time span, seafarers had an annual rate of 5.7 hearings per year (57 cases over 10 yr), while aviators had an annual rate of 2.9 hearings per year (55 cases over 19 yr). The age of applicants/appellants was recorded in 98 (88%) cases (marine, $N = 55$; aviation, $N = 43$). The mean age of applicants/appellants in marine cases was 49 yr (± 14 yr), ranging from 19 to 73 yr, while the mean age of applicants/appellants in aviation cases was 54 yr (± 18 yr), ranging from 18 to 84 yr. All applicants and appellants were in safety-critical positions.

A detailed breakdown of types and numbers of each primary diagnosis that precipitated a review is presented graphically in **Fig. 1** and detailed in **Table II**. The two most common diagnoses in aviation and marine was mental illness, with a combined total of 40 (36%) cases, followed by a combined total of 29 (26%) cases of cardiovascular disease. The third most common diagnosis in the marine sector was 11 (19%) cases of a sensory (i.e., visual) diagnosis, and with the aviation sector it was 6 (11%) cases of a neurological diagnosis.

At the review hearings, the TATC member upheld TC's decision in 89 (79%) cases; 43 (51%) cases were marine and 44 (49%) cases were aviation. After the hearing, 23 (21%) cases were referred back to TC for reconsideration; 12 (52%) were marine and 11 (48%) cases were aviation. There were several reasons for this, but to maintain confidentiality, we feel comfortable in simply saying that the member analyzed the evidence presented by both parties in order to make findings of fact and then applied the law to those facts. In five (22%) cases referred back, TC did not modify the decision after it was asked to reconsider; that is to say, TC took note of the member's analysis, but upheld the original decision. In 7 (30%) cases, TC modified the original decision, and 11 (48%) cases are currently still under review. The diagnoses in the overturned decisions by TC were three in cardiovascular, two in sensory (vision), and one each in the neurological and general addiction categories.

There were eight cases in which the applicant disagreed with the member's upholding of TC's decision at the review hearing. These cases then proceeded to a total of eight appeal hearings; two (25%) were marine and six (75%) cases were aviation. Five (63%) of the original decisions were upheld by a TATC appeal panel, two (25%) are currently awaiting a TC decision, and in one (12%) case, the appeal went to the Federal Court, where the Tribunal's decision that confirmed TC's decision was upheld.[2]

Hearings were conducted across Canada, with 29 (26%) in Quebec, 23 (21%) in British Columbia, 16 (14%) in both Ontario and Newfoundland, respectively, and 12 (11%) in Nova

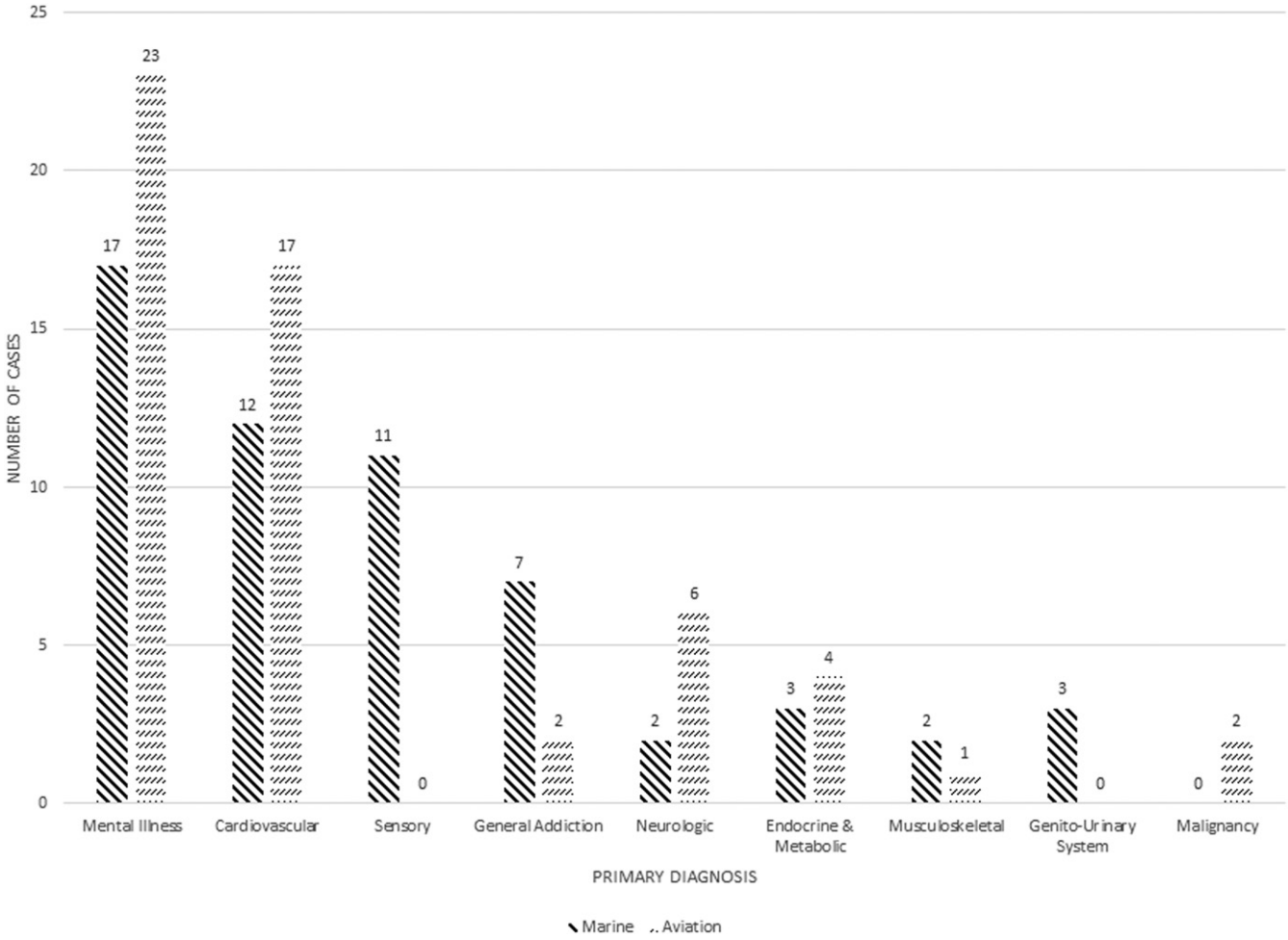

Fig. 1. Breakdown of the diagnoses causing the primary requests for a review hearing in each transportation sector.

Table II. Breakdown of the Number of the Review Hearings Comparing the Medical Condition with the Transportation Sector.

	OVERALL		MARINE		AVIATION	
PRIMARY DIAGNOSIS	#	%	#	%	#	%
Mental Illness	40	36%	17	30%	23	42%
Cardiovascular	29	26%	12	21%	17	31%
Sensory	11	10%	11	19%	0	0%
General Addiction	9	8%	7	12%	2	4%
Neurological	8	7%	2	4%	6	11%
Endocrine & Metabolic	7	6%	3	5%	4	7%
Musculoskeletal	3	3%	2	4%	1	2%
Genito-Urinary System	3	3%	3	5%	0	0%
Malignancy	2	2%	0	0%	2	4%
TOTAL	112	100%	57	100%	55	100%

Scotia. The highest number of marine hearings were in Newfoundland ($N = 13$, 23%), while the highest number of aviation hearings were in Quebec ($N = 18$, 33%). **Table III** provides a breakdown of the location of each hearing, divided by marine and aviation sector.

The case processing time, from initial request for review to the issuance of a determination or appeal decision, was on average 483 d; however, this varied from as little as 77 d to 1331 d, due to several different factors. One major one for the longer decisions is that some cases start as a review hearing and proceed on to an appeal hearing, whereas others end at a review hearing only. **Table IV** provides a breakdown by sector of the elapsed time (days) between original application and issuance of a determination or decision. **Table V** identifies the number of cases referred back to TC after a review or appeal hearing with resulting TC final decision.

DISCUSSION

A common thread runs through virtually every hearing: being considered fit to work by an applicant's attending physician is not the same as being considered fit to fly an aircraft or to operate/crew a marine vessel. For safety reasons, in both the aviation and marine environment, national and international guidelines insist on a higher physical and mental standard for workers in those fields than for the general public. TC applies a significant

Table III. Breakdown of Hearing Location, Divided by Transportation Sector.

	OVERALL		MARINE		AVIATION	
PROVINCE	#	%	#	%	#	%
Quebec	29	26%	11	19%	18	33%
British Columbia	23	21%	10	18%	13	24%
Newfoundland	16	14%	13	23%	3	5%
Ontario	16	14%	8	14%	8	15%
Nova Scotia	12	11%	12	21%	0	0%
Alberta	5	4%	0	0%	5	9%
Prince Edward Island	4	4%	3	5%	1	2%
Manitoba	4	4%	0	0%	4	7%
Saskatchewan	2	2%	0	0%	2	4%
Yukon	1	1%	0	0%	1	2%
TOTAL	112	100%	57	100%	55	100%

Table IV. Elapsed Time (Days) Between Original Application and Determination/Decision Issued, Divided by Transportation Sector.

VARIABLE	OVERALL	MARINE	AVIATION
N	98	55	43
Mean (days)	483	566	397
SD (days)	260	244	250
Shortest (days)	77	190	77
Longest (days)	1331	1331	1023
Unknown Cases	14	2	12

level of caution when granting, reissuing, or refusing a medical certificate. It became immediately clear from all 112 cases that very few of the applicants' family physicians or any of the attending specialists were aware of the national or international medical guidelines related to the employment of aviators and seafarers.

The aviation and marine professionals that come before the Tribunal have an average age of 54 and 49, respectively, and they generally occupy senior positions in their fields. Of the 112 appellants, the majority 106 (95%) started their professions fit and healthy with an unrestricted medical certificate and, in mid or later life, they developed problems. There were only six (5%) refused an initial medical certificate.

During the review process, applicants often cite the loss of their medical and competency certification affects their job security, financial situation, working prospects, or self-esteem. The Tribunal's role as an independent adjudicator of the decision taken by the regulator is therefore crucial for administrative justice.

Alcohol and drug abuse were associated with some of the mental illness cases, but was not the primary diagnosis that caused a refusal to renew a medical certificate. There were a number of appeals where alcohol and drug abuse were the primary diagnosis and these were considered in a separate category.

The preponderance of men in this study reflects the fact that there are only around 4–6% of women in the aviation and marine professions.[5,6] The study of those 112 cases revealed that not all medical information may be divulged or known by the applicant at the initial medical examination with the aviation or marine medical officer (AME or MME). A medical problem, or progression of a pre-existing one, may not be discovered until another examination is conducted at the time of renewal of the certificate. In some cases, throughout the period of a current certificate, a medical issue can develop which leads to the discovery of an undisclosed or previously unknown condition that may have public safety implications. In such a situation, there could be a cancellation of a medical certificate, a refusal to renew, or a limitation applied, which can result in a request for a review by the Tribunal.

The precise number of medical files held by TC is not published, but from testimony presented before the Tribunal at some hearings, it is estimated that there are approximately 60,000 files for aviators and 40,000 files for seafarers. The number of certificate refusals or restrictions that never come before the Tribunal are also not reported publicly or published. Even

Table V. Breakdown of TATC Decisions and Outcomes in All 112 Cases.

	REFERRED BACK AFTER REVIEW HEARING				REFERRED BACK AFTER APPEAL HEARING			
CONCUR WITH TC DECISION	TOTAL	UPHELD	OVERTURNED	PENDING	TOTAL	UPHELD	OVERTURNED	PENDING
81	23	5	7	11	8	6	0	2

though the total of 100,000 files is an estimate, it leads us to infer that the rate or number of reviews by the Tribunal is a tiny fraction of all medical assessments.

The annual review and appeal rate for marine cases since 2010 (when marine cases were first heard by the TATC) was twice as many (5.7/yr) as compared to aviation cases (2.8/yr). There are a number of reasons for this, which are addressed as follows.

Concerning some medical diagnoses, the marine guidelines, unlike the aviation guidelines, have no option to use the "1 or 2% risk factor." For instance, it may be possible to grant a waiver to a pilot to fly with or as a copilot if he/she has a small renal calculus stuck firmly in a calyx of the kidney, resistant to or too small to treat possibly for years, as long as he/she is only a few hours away from a dedicated medical facility. In such a scenario, the risk of incapacitation is less than 2%. Conversely, with a similar condition in a ship's master, a senior marine engineer, or a skipper of a large open ocean fishing vessel, one who operates in international waters for weeks at a time with only access to the ship's medical chest for treatment of this small renal calculus, rather than evaluating the risk of a further occurrence while at sea, the IMO guidelines advise that the seafarer be issued with a 'Near coastal class' category type of certificate that allows the seafarer only to operate close to shore. This could potentially affect their work prospects.

TC has two different medical protocols for the aviation and marine sectors when it comes to the issuance of medical certificates. In the aviation sector, there are up to four levels of review by physicians trained in aviation medicine, such reviews being conducted by: 1) the AME who performs the original examination; 2)The Regional Aviation Medical Officer (RAMO) who reviews the AME decision and who is assigned to one or more Canadian provinces and to aviators operating overseas; 3) the Aviation Medical Review Board (AMRB), which consists of at least 10 consultant physicians dealing in clinical aviation medicine who review complex cases; and 4) the Director of the Aviation Medical Unit who makes the final decision in some cases. The marine medical unit has a two-tiered system: the first level of assessment by the MME and the second level by a Marine Medical Officer at TC.

One issue that came up more than once is that seafarers who wear corrective lenses and are assigned emergency duties, for example during ship abandonment, require 20/200 uncorrected vision in case their eyewear fogs over or freezes up, or if they lose their corrective lenses in an emergency situation. Some of the cases before the TATC are related to the visual assessments of the uncorrected vision by MMEs. It became apparent that optometrists are interested in what a patient can see, not what he/she cannot see. In those types of cases, the evidence showed uncorrected vision of the patients is not always reported by the optometrist to the MME. In order for an ab initio seafarer to start work, he or she needs to have a provisional medical certificate issued at the time of the examination. The provisional medical certificate is valid for up to 6 mo when issued for the first time, after which it is reviewed by the Marine Medical Unit at TC's headquarters. There have been cases where the seafarer started to work and was subsequently informed, after further referral to an optometrist or ophthalmologist, that the seafarer's uncorrected vision was out of specification. In such a situation, the medical certificate would be refused and the seafarer could then request a review of that decision, the reason being that the potential seafarer has gone to additional steps and expense to obtain the safety course certificate that allows him/her to start work on a vessel.

What little data is available from other countries does not subdivide hearings into review and appeal hearings, just referring to them all as 'appeals or redresses.' Therefore, we have combined all our appeals into one category for comparison with international data. Canadian aviation appeals are in reasonable agreement with those of the Civil Aviation Authority (CAA) data. Their Chief Medical Officer noted "a very small number of redresses" due to the three-tiered multilevel method of assessment. On the marine side, the Chief Medical Officer for the UK Marine Coastal Agency (MCA) noted there were 48 appeals out of 53,315 medical examinations conducted in 2017, and that this number has been stable since 2010, at which time it was around 50 cases per annum.[11] The Canadian marine annual rate of review is lower than the MCA data.

It does not appear that either the U.S. Federal Aviation Administration (FAA) or the U.S. Coast Guard (USCG)/ National Maritime Center (NMC) publish data on appeals, but from information published in 2012 in the *Professional Mariner Journal*, the NMC reported that in 2011, there were 240 appeals (85% were medical).[15] It did not, however, report the total number of seafarer medical examinations for that year. This data is not directly comparable, but would suggest the marine appeal rate in Canada again is lower than that of the United States.

Although the FAA and USCG do not appear to report this data, it is possible to make an indirect comparison with the number and nature of U.S. medical disqualifications in military and civilian aviators which have been extensively reported over the last 40 yr in the Aerospace Medical Association journal and the Federal Aviation Administration.[7,8] These diagnoses have remained unchanged. The most common diseases have only changed in order of frequency depending on the operation and population. Mental illness, cardiovascular disease, visual problems, diabetes, and alcoholism are the most prevalent, and for younger military personnel, musculoskeletal problems and PTSD have been reported more often recently. The TATC data is in agreement with this same pattern, in that mental illness

and cardiovascular disease are the most common diseases that cause either a restriction or cancellation of a medical certificate.

For seafarers, we must turn to the United Kingdom to make direct comparisons. For the last 15 yr, the MCA has kept records of the number of disqualifications and the causes. For 2017, the MCA had 48 appeals. Respiratory disease was the principle cause. Obesity and hypertension were noted as becoming more common as associated with such illnesses as diabetes. There have not been any cases at the TATC related to a respiratory cause and in only one case was obesity noted as an indirect contributor to the cardiovascular illness. Our cases were otherwise similar and the overall rate of appeals is lower. The principal cause of appeals due to respiratory disease in the United Kingdom may be a reflection of the fact that in 2019, one-fifth of the population has asthma, chronic obstructive pulmonary disease, or other related respiratory diseases. Respiratory disease is the third largest cause of death in that country.[12]

In 23 of the original 112 cases, the member referred the case back to TC after the review hearing (11 aviation and 12 marine). After re-evaluation of these 23 cases, TC upheld the original decision in 5 cases; there are still 11 cases pending and the important fact is that the medical decision was changed in 7 cases, an overall reconsideration rate of 6%. Following an appeal hearing in the eight cases that have gone to that level so far, none overturned the original regulator's decision. One case was challenged before the Federal Court; the Court upheld the Tribunal's decisions, citing that "flight and public safety outweighs the individual benefits."[2]

This 6% overall rate of reconsideration indicates to us that medicine is not an exact science. An independent medical review by a tribunal of a TC decision demonstrates that some decisions are not straightforward. In the interest of fairness and natural justice, taking into consideration personal and public safety, the current administrative review system is efficient in monitoring the medical disposition of aviators and seafarers, keeping personal and public safety in mind, and maintaining flexibility in the final decision when the evidence is reviewed.

In the United States, there is no Federal aviation data available for the purposes of any comparison, but for the United Kingdom, according to the Chief Medical Officer for the CAA, there are very few aviation appeals (no numbers provided) due to their three-tiered system. In Canada, the 55 aviation cases appealed and 11 cases referred back to TC for reconsideration over 19 yr can also be considered extremely low.

There were 57 marine cases appealed and 12 cases referred back to TC since 2010, which is, again, a very small number. U.S. data is not available. However, the Medical Evaluation Division of the USCG National Maritime Center states that the main reasons for denial of appeals were coronary artery disease, uncontrolled diabetes, sleep disorders, seizures, and chronic use of narcotics, benzodiazepines, and sedative-hypnotic medication.[15] Even though this is very vague data, the primary cause of denial is in agreement with TATC data. While none of our cases involved sleep disorder, several were related to alcohol abuse. We note there was no mention of mental illness, although this could have been classified in the section on narcotics, benzodiazepines, and so forth.

Very detailed data is given in the UK MCA report. Referral to referees, which we presume is equivalent to our TATC members, has dropped since the revision of the IMO guidelines in 2010 and remains stable at just under 50 each year. In 2017, there were 53,315 medical examinations conducted, with a total of 48 appeals.[11] The precise number of Canadian marine medicals conducted by TC is not published, but a very crude approximation is around 40,000, with an initial review hearing appeal rate of 5.7 per year. This would suggest that the UK has an appeal rate which is approximately six times greater than Canada.

Completion time from request of a hearing until a decision by TC can be as short as 77 d, once all arrangements are successfully made for the parties to convene. Such arrangements would include the applicant having all the documentation assembled and lawyer(s), union representative, and medical witnesses all available. Additionally, the availability of TC legal counsel and physicians, and a TATC member would all be factors in the successful completion of a case in a relatively short time span. From our experience, however, it is very difficult to arrange for all the key players to be in one place at the same time, especially for travel to remote places in the winter months. Furthermore, if the applicant has already requested a hearing, there could be pending medical exams or documents which may not be available until their next medical outpatient appointment, for instance in 6 mo, so nothing can be formalized until this occurs and, as stated above, some review hearings proceed to appeal hearings, which essentially at least doubles the time in which the case is active.

There is virtually no data from the United States or United Kingdom to make a comparison except a brief paragraph in the 2012 *Professional Mariner* journal that stated if the NMC denies a certificate, it may take around 140 d to process an appeal. Their office, a branch of the USCG, is staffed by 3 physicians, 14 physician assistants, several certified medical assistants, and a medical help desk.

The most common diagnoses resulting in the Canadian tribunal cases involving aviators and seafarers are mental illness and cardiovascular disease. The annual TC data on how many medical files contain a restricted category or are refused is not publicly available. Nevertheless, considering the very large number of aviation and marine medical files held by Transport Canada, the number of requests for review and appeal hearings is very low.

Because the FAA and USCG do not publish their data, it has only been possible to make indirect comparisons through papers published by the Aerospace Medical Association. Nevertheless, the clinical reasons for TC's denial or issue of a restricted certificate to an aviator is in agreement with the data reported in this literature. Canadian data also compares well with that published by the UK CAA and MCA.

Even though the numbers are very small, there have been twice as many appeals in the marine sector. One reason for this could be that IMO guidelines do not recommend applying the

1–2% rule as the ICAO does in the aviation sector. A second reason is that the TC Marine Medical Unit only has a two-tier level of assessment and no equivalent to the AMRB. The addition of a Marine Medical Review Board consisting of physicians would likely lower the number of reviews and appeals.

ACKNOWLEDGMENTS

Dr. Stephen Verroneau and Ms. Roni Anderson from FAA Oklahoma City, Dr. Sally Bell and Ms. Caroline Livingstone from the UKMCA, and Dr. Sally Evans from the CAA have all been of great help in locating their national information on appeals, and we have to thank Ms. Jacqueline Corado for all her legal advice, and Carl Guignion for assisting us in editing the manuscript.

Financial Disclosure Statement: The authors have no competing interests to declare.

Authors and affiliation: Chistopher J. Brooks, M.B.Ch.B., D.Av.Med., and Conor MacDonald, M.Sc., B.Sc., Transportation Appeal Tribunal of Canada, Ottawa, Ontario, Canada.

REFERENCES

1. Canadian Aeronautics Act, 2017. RSC 1985, c. A-2. Ottawa, Ontario (Canada): Parliament of Canada; 2017.
2. Canadian Federal Court. Corneil v. Canada FC 755. Ottawa, Ontario (Canada): Transportation Appeal Tribunal; 2015.
3. Canadian Marine Personnel Regulations. SOR/2007-115. Ottawa, Ontario (Canada): Canadian Department of Justice; 2015.
4. Canada Shipping Act, 2001. S.C. 2001, c.26. Ottawa, Ontario (Canada): Parliament of Canada; 2001.
5. CAPA-Centre of Aviation. Women airline pilots; a tiny percentage and only growing slowly. 07 August 2018. [Accessed December 2019]. Available from https://centreforaviation.com/analysis/reports/women-airline-pilots-a-tiny-percentage-and-only-growing-slowly-432247.
6. Chamber of Marine Commerce. Day of the seafarer: marine shipping industry needs more women. 25 June 2019. [Accessed December 2019]. Available from https://www.marinedelivers.com/2019/06/marine-shipping-industry-needs-more-women/.
7. Curry IP, Kelley AM, Gaydos SJ. Clinical diagnosis leading to suspension in Army aircrew: an epidemiological study. Aerosp Med Hum Perform. 2018; 89(7):587–592.
8. De John CA, Wolbrink A, Larcher JG. Flight incapacitation and impairment of U.S. airline pilots, 1993–1998. Oklahoma City (OK, USA): CAMI, FAA; 2004. Report No.: FAA DOT/AM-04-16.
9. International Civil Aviation Organization. Manual of civil aviation medicine, 3rd ed. Montreal (Canada): ICAO; 2012.
10. International Labour Office/International Maritime Organization. Guidelines on the medical examination of seafarers. Geneva: International Labour Office; 2013.
11. Marine and Coastal Agency UK. Summary of medical examinations of seafarers conducted by approved doctors 1st January–31st. Southampton (UK): Marine and Coastal Agency UK; December 2017.
12. Shepherd A. Every breath you take. BMJ. 2019; 364:l1399.
13. Transport Canada. The handbook for civil aviation medical examiners. TP 13312. Ottawa, Ontario (Canada): Transport Canada; 2019.
14. Transport Canada. Seafarer medical examinations, a physician guide. TP 11343(E). Ottawa, Ontario (Canada): Transport Canada; 2013.
15. Yanchunas D. License denials soar as NMC scrutinizes medical evaluations. Professional Mariner, 26 July 2012. [Accessed December 2019]. Available from http://www.professionalmariner.com/August-2012/License-denials-soar-as-NMC-scrutinizes-medical-evaluations/.