

Review of the Accident Compensation Corporation's radiation therapy injury claims, 1 July 2009–30 June 2019

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ABSTRACT

AIM: The aim of this study was to review and report on radiation therapy injury claims lodged with the Accident Compensation Corporation (ACC) in New Zealand in the last decade.

METHODS: ACC's treatment injury database was used to identify injury claims decided between 1 July 2009 and 30 June 2019. The associated structured and unstructured data, including claim lodgement information and medical records, were reviewed.

RESULTS: Of 121,168 treatment injuries, only 975 (0.8%) were radiation therapy injury claims, with 519 claims accepted for cover. Most declined claims were considered "ordinary consequences of treatment" rather than treatment injuries. Of the 519 accepted claims, ACC classified 21 as fatal and eight as serious, which indicates a need for lifelong ACC support. Injuries correlated with the age and gender of the most common cancers treated with radiation therapy in New Zealand. More treatment injury claims were submitted and accepted for New Zealand European patients compared with Māori and Pasifika patients.

CONCLUSION: Radiation therapy injury claims make up a very small proportion of the total number of ACC treatment injury claims. A better understanding of the claim process may assist injured individuals better by improving appropriate claim lodgement and claim acceptance rates.

The Accident Compensation Corporation (ACC) was established by the New Zealand Government in 1974 following the passing of the Accident Compensation Act in 1972.¹ The Accident Compensation Act 2001 sets out ACC's current purpose, putting increased focus on injury prevention and rehabilitation. The Accident Compensation Amendment Act passed in 2005 replaced "medical misadventure" with "treatment injury," expanding the rather narrow grounds for cover.¹ Currently, ACC provides financial and rehabilitative support to all New Zealand citizens, residents and visitors who have been injured in an accident or from medical treatment in New Zealand.²

Treatment injury claims must be lodged by a registered health professional with consent of the patient. The lodgement process involves the registered health

professional submitting a specific treatment injury lodgement form, ACC2152, and an ACC45 lodgement form.² Successful claims cover injuries caused by treatment that are *not* ordinary consequences, or necessary parts, of treatment. Acceptance of a claim depends on the clinical knowledge at the time of treatment and the underlying health condition of the patient. Once a claim is accepted, ACC can provide payments towards treatment, rehabilitation and compensation, so that clients can get back to their daily lives or a "new normal."

Radiation therapy, as part of a multidisciplinary approach, makes up a substantial component of cancer treatment, with more than half of all cancer patients receiving radiation therapy as part of their cancer treatment.^{3,4} In the 2019 calendar year, 11,319 courses of radiation therapy were

delivered in New Zealand (Radiation Oncology Online Tool⁵). The National Radiation Oncology Plan 2017 to 2021⁶ reported that the radiation therapy rates were 64% for breast cancer, 24% for prostate cancer and 50% for rectal cancer. During radiation therapy, exposure of normal healthy tissue to a certain dose of radiation is unavoidable and can result in acute and chronic side effects.⁷ Many of these side effects would not be considered ACC treatment injuries but common side effects of radiation treatment. Side effects such as osteoradionecrosis or secondary cancers may be covered by ACC as treatment injuries. Injuries resulting from incorrect radiation treatment or site, incorrect positioning or patient transfer and equipment breakages may also be covered by ACC as treatment injuries.²

This study explored the incidence, type and costs of radiation therapy injury claims from the last decade, with the aim of increasing health professionals' understanding of the ACC treatment injury claim process and legislated criteria to better assist injured individuals.

Methodology

This retrospective analysis reviewed ACC's treatment injury claims database for radiation therapy injury claims decided between 1 July 2009 and 30 June 2019. An ACC Privacy and Ethics Threshold Analysis (PETA) document detailing the specific data fields and the reasons for using the radiation therapy injury data was signed off by ACC's Privacy Officer on 15 November 2019.

The analysis used code-based methods to select an inclusive cohort of patients with injuries from radiation therapy. For the inclusive claim cohort, the associated demographic, treatment, injury and patient journey information was analysed using both structured data fields, which gave injury, cost and demographic information, and unstructured data fields, which contained additional clinical information about the radiation treatment and the injury. Review of the individual claim details in the inclusive cohort was conducted to extract additional data fields that allowed further detail of the type and extent of injury and enhanced the quality of the data.

The timeframe of 10 years captured a sufficient number of claims for analysis and

allowed a lag period for recently assessed claims data to be as accurate as possible. Treatment injury claims have a legislated timeframe of nine months for the initial cover decision. These claims can be reassessed within five months of the initial cover decision.

Data sources

Data included in this paper were sourced from ACC's EOS claims management system, the primary source of claims information for ACC. ACC payment, review and risk of harm databases were also accessed. The Ministry of Health's New Zealand Cancer Registry and radiation treatment volumes were accessed from the Radiation Oncology Online Tool,⁵ and New Zealand population data were sourced from Statistics New Zealand.⁸ The "deep dive" into the unstructured data for the accepted claims was carried out to create additional structured data fields. Once the data quality and deep dive processes were completed, the final data extraction was conducted on 17 August 2020.

Data quality review

When a treatment injury claim is lodged, information is put into the structured and unstructured data fields in EOS, which are updated as more information is gathered during the cover assessment process. Data quality issues arise when fields are not completed or not updated appropriately. Although ACC has processes in place to review known data issues, data quality reports do not consider every possible issue. Issues may only become evident when individual claim details are reviewed. When the radiation therapy claims were reviewed for this study, various data issues were identified, including: (1) wrong treatment facility where data were recorded for the facility where the injury was identified instead of where the radiation therapy was delivered, (2) wrong injury or lack of injury detail, (3) wrong treatment event where radio-ablation or chemotherapy was recorded as radiation therapy and (4) missing fields. For this study, data issues were rectified by an ACC treatment injury cover specialist.

Data analysis

SAS Enterprise Guide 7.1 was used to extract EOS data from the relevant ACC databases, using structured data fields. Excel 365 ProPlus was used to collate the extracted data into tables and figures. Data analysis

was purely descriptive, with averages and ranges provided where useful.

Results

Incidence of radiation therapy injuries

Between 1 July 2009 and 30 June 2019, a total of 121,168 treatment injuries were received and decided by ACC, with 75,966 claims (63%) accepted for cover. Only 975 claims (0.8%) were for injuries specifically related to radiation therapy, with 519 claims (53%) accepted for cover (Table 1). The acceptance rate over the decade was 53% (range 43.1% to 62.2%).

On average, 47% of radiation therapy claims were declined each year. The vast majority (399, 88%) of declined claims did not meet the cover criteria: (1) identification of a specific injury, (2) a clear causal link to the radiation therapy and (3) the injury must not be an ordinary consequence of radiation therapy (Table 2).

The effect of demographics on injury claims

The demographic data for the radiation therapy injury cohort are presented in

Table 3. The age groups consider the age of the client at the date of injury, which is the date the client first sought treatment for the covered injury. The date of injury can correspond to the date of radiation therapy (skin infections) or can be many years apart (secondary cancers). Claims associated with prostate cancer were most common in the 65–74-year age group (45% of prostate cancer registrations in 2017). Breast cancer claims were most common in the 45–64-year age group (50% of breast cancer registrations in 2017). For claims associated with colon, rectum and rectosigmoid cancer, the most common age group was the 75+ age group (41% of registrations). Overall, the accepted radiation therapy injury claims were highest in 50–69-year age group for females (51% of accepted claims) and the 60–79-years age group for males (55% of accepted claims).

ACC ethnicity data are based on a system of prioritisation that reduces multiple ethnic responses to a single response: for example, all Māori are classified as Māori regardless of additional ethnicities.

In the ten financial years 2009/10 to 2018/19, New Zealand Europeans made

Table 1: Radiation therapy (RT) injury claims with ACC cover decision.

Cover decision financial year	Radiation therapy claims				RT claims % of all TI* accepted	RT claims as % of all TI
	Accept	Decline	Total	% Accept		
2009/10	34	43	77	44%	0.7%	0.9%
2010/11	30	32	62	48%	0.6%	0.7%
2011/12	31	41	72	43%	0.6%	0.8%
2012/13	42	31	73	58%	0.7%	0.7%
2013/14	51	31	82	62%	0.7%	0.8%
2014/15	48	38	86	56%	0.6%	0.7%
2015/16	55	49	104	53%	0.6%	0.7%
2016/17	68	53	121	56%	0.7%	0.8%
2017/18	83	74	157	53%	0.8%	1.0%
2018/19	77	64	141	55%	0.7%	0.9%
Total	519	456	975	53%	0.7%	0.8%

* TI: Treatment injury.

Table 2: Reasons for declining radiation therapy injury claims in the period from 1 July 2009 to 30 June 2019.

Decline reason	Decline claim count	% decline
Ordinary consequence of treatment	246	54%
No causal link to radiation	93	20%
No injury	60	13%
Lack of information	20	4%
Withdrawn	18	4%
Underlying health condition	11	2%
Necessary part of treatment	4	1%
Other	4	1%

Table 3: Radiation therapy injury claim decisions by age group and gender in the period from 1 July 2009 to 30 June 2019.

Age group	Accept		Decline		Total	
	Female	Male	Female	Male	Female	Male
0–19	5	7	7	8	12	15
20–29	9	6	7	8	16	14
30–39	27	9	15	8	42	17
40–49	42	21	49	20	91	41
50–59	75	48	51	52	126	100
60–69	58	84	54	59	112	143
70–79	33	58	41	51	74	109
80+	11	26	10	16	21	42
Total	260	259	234	222	494	481

up 75% of treatment injury claims (76% of accepted claims); Māori made up 10% of total and accepted claims, Asian 5% and Pasifika 4%. These proportions differ for radiation therapy specific injuries: New Zealand Europeans make up 80% (81% of accepted claims), Māori make up 9% (8% of accepted claims), Asian 2% and Pasifika 3% (2% of accepted claims) (Table 4).

The effect of the district health board regions on injury claims

Radiation therapy is currently available in seven district health board (DHB) regions at ten public and private facilities. For ACC purposes, the DHB region is where the radiation therapy that resulted in the injury was delivered. The number of claims resulting from treatment within different regions will relate to the population in that region, the technology and expertise available and clinicians' awareness of treatment injury claims. The Auckland DHB region had the highest number of treatment injuries but one of the lower acceptance rates. The Bay of Plenty DHB region had the highest acceptance rate followed by the Southern DHB region, despite the former having the smallest claim numbers (Table 6).

The effect of different registered health professionals on injury claims

The majority (53.1%, n=518) of radiation therapy claims decided in the last ten financial years were lodged by general practitioners, followed by claims lodged by DHBs (29.2%, 285 claims) and private clinics or hospitals (13.5%, 132 claims). The remaining

40 claims were lodged by other providers. Excluding the latter, claims lodged by private providers were most likely to be accepted (68%) (Table 6).

Costs of radiation therapy treatment injuries

Radiation therapy injuries can range in severity from minor (skin infection) to critical (secondary cancers). The overall cost of a treatment injury claim is an indicator of the severity of the injury. Of the 519 accepted claims, 513 (99%) had received ACC payment(s) totalling \$26.6 million to date. Of the total cost, 52% related to compensation payments, of which \$8 million was paid as weekly compensation to 85 individuals who were injured and unable to work (Table 7). Individual claim costs range from under \$20 to over \$700,000. The average claim cost for accepted claims paid was \$51,866, and the median was \$12,254. There were 72 claims that had received \$500 or less and these injuries were likely to be of low severity. There were 63 claims that had received over \$100,000 in payments, which likely indicates these were higher severity injuries. Fatal claims (21 out of 519 accepted claims) accounted for 17% of the total cost for radiation therapy related claims, with a total cost of \$4.5 million. As expected, most of these costs were compensation payments (80% of fatal claim costs, \$3.6 million), that is, weekly compensation and lump sum payments made prior to death and death benefits for surviving dependents. The remaining costs were payments for rehabilitation services (11 claims), including support for independence and vocational

Table 4: Radiation therapy injury claims by ethnicity and cover decision in the period from 1 July 2009 to 30 June 2019.

Ethnicity	Accept	Decline	Total	% accept
New Zealand European	422	357	779	54%
Māori	43	47	90	48%
Pasifika	10	19	29	34%
Asian	11	11	22	50%
Residual categories	22	12	34	65%
Other ethnicity	11	10	21	52%
Total	519	456	975	53%

rehabilitation prior to death, and payments for treatment (19 claims), including medical and hospital treatment. There were eight accepted serious injury claims in the last decade and five of these were for patients treated prior to 1990. The cost associated with serious injury claims was \$3.8 million.

Discussion

ACC's treatment injury database is a unique, valuable resource that allows reporting of the incidence of treatment injuries in New Zealand. This study set out to explore treatment injuries resulting from radiation treatment between 1 July 2009 and 30 June 2019.

Radiation therapy injuries made up a very small proportion (0.8%) of total ACC treatment injury claims, with a lower acceptance rate (53%) than the total treatment

injury acceptance rate (63%). To give some context, in the five financial years from 1 July 2014 to 30 June 2019, there were 124,904 cancer registrations and 42,399 new episodes of radiation treatment.⁸ During that time there were 609 radiation therapy injury claims, of which 331 (54%) were accepted. ACC is a uniquely New Zealand compensation system for people who have been injured on a no-fault basis, which precludes a direct comparison with other countries.

The most common reason for declining radiation therapy injury claims was that the injury was considered an ordinary consequence of treatment (54% of all claims). In recent years the threshold of what is considered ordinary in terms of treatment injury criteria has been considered by the Courts of New Zealand. In 2018, the High Court expanded the ruling to state that

Table 5: Radiation therapy injury claims by DHB region of treatment and cover decision.

DHB region	Accept	Decline	Total	% accept
Auckland	135	129	264	51%
Bay of Plenty	26	8	34	76%
Canterbury	102	67	169	60%
Capital & Coast	63	55	118	53%
MidCentral	37	41	78	47%
Southern	55	35	90	61%
Waikato	96	68	164	59%
Other regions	5	53	58	9%

Table 6: Claim count and acceptance rate by lodging provider type.

Lodging provider	Accept	Decline	Total	% accept
DHB	167	118	285	59%
GP	231	287	518	45%
Private provider	90	42	132	68%
Other	31	9	40	78%
Total	519	456	975	53%

GP: general practitioner. DHB: district health board.

ordinary consequence means a consequence that has more than a 50% chance of occurring.⁹ From 2009/10 to 2017/2018, the proportion of total injury claims declined due to ordinary consequence averaged 57%. This decreased in 2018/19 to 38%, suggesting that the broadening of the ordinary consequence threshold could have decreased the claim decline rate. The High Court ruling on ordinary consequence was recently overturned by the Court of Appeal,¹⁰ which decided that ordinary consequence was ultimately a matter of judgment to be exercised on a case-specific basis by taking into account all the circumstances of treatment and the particular patient.

Māori and Pasifika make up 17% and 8% of the New Zealand population respectively.¹¹ However, they are underrepresented with respect to claim lodgement (10% and 4%) and claim acceptance (9% and 3%). Ethnicity has been reported to affect radiotherapy rates worldwide.^{12–16} In New Zealand, the Cancer Control Agency recently released a report, *The State of Cancer in New Zealand 2020*, which states that Māori are 20% more likely to develop cancer, and twice as likely to die from cancer, than non-Māori.¹⁷ Māori women with breast cancer are less likely to receive radiation therapy than New Zealand European women.^{18,19} A report for the Department of Labour (now incorporated into the Ministry of Business, Innovation and Employment) in 2010, *Māori Experience of ACC*, states that Māori experiences of care in relation to ACC are dependent on Māori experiences with the rest of the health system. Healthcare disparities affect Māori access to and utilisation of ACC services.²⁰ Limited access to health services for diagnosis and radiation therapy, physical access and personal/

whānau views and lack of trust in the New Zealand healthcare system and ACC may all contribute to under-representation in this field.

The demographics of the cohort injured by radiation therapy reflect the age and gender of the most common cancers in New Zealand treated with radiation therapy (alone or in conjunction with other modalities). Many cancers in young patients are more likely to be treated with chemotherapy, and older patients may be too fragile or have co-morbidities that preclude radiation therapy as an option.^{21,22} The acceptance rate of claims varied among DHB regions and types of registered health professional lodging claims.

Radiation therapy injuries vary in severity. Of the accepted claims, 4% were classified as fatal and 2% as serious injury requiring lifelong support. Of all accepted claims, 12% had received over \$100,000, indicating they were more severe injuries. The compensation component of the cost proxy may obscure the severity measure, as relatively minor injuries in the working age population may incur higher compensation costs.

Limitations

Due to the scope of this retrospective analysis, there are limitations with the information collected and there is the potential for further investigation. A conservative approach was taken to selecting the radiation therapy cohort for this analysis. Due to the deep dive process, the filter used to extract relevant claims for this analysis is unlikely to include claims falsely identified. However, it is possible that claims resulting from a combination of radiation therapy and surgery and/or chemotherapy were missed. Future analyses could use alternate date

Table 7: Cost, excluding GST, and accepted claims paid by cost group in the period from 1 July 2009 to 30 June 2019.

Cost group	Cost (ex GST)	Accepted claims paid	% of total cost
Compensation	\$13,794,065	323	52%
Rehabilitation	\$5,154,730	199	19%
Treatment	\$7,658,455	507	29%
Total	\$26,607,250	513	100%

fields, such as injury date or payment date, or filters could be applied to remove claims treated historically.

Client-facing ACC staff are responsible for the cover assessment of treatment injury claims and the input of data. There are guidelines on what information should be put in the various fields, but due to time constraints, workload and a lack of understanding of the data's end use, relevant information is not always captured or captured accurately. Although there are ACC processes to minimise data quality issues, some data quality issues may have been missed and this could have affected the data quality in this study.

The ACC cost information is a snapshot in time, as payments are reconciled and the total cost paid to the radiation therapy

cohort increases over time as clients continue to receive services. The more recently accepted claims have had less time to accrue costs. The cost information does not include the cost of services provided under the public health acute services contract, whereby funding is distributed to DHBs, and thus could be an undercount of the true injury cost.

In summary, ACC radiation therapy injury claims are rare, and the acceptance rate is relatively low. We hope that this study will increase awareness of the ACC claim lodging process and the ordinary consequences exclusion criterion. This increase in awareness has the potential to increase appropriate claim lodgement and therefore the claim acceptance rate to better assist individuals injured through radiation therapy treatment.

Competing interests:

Nil.

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