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## **A MODEL FOR PREVENTING RUGBY UNION AND LEAGUE INJURIES WITHIN NEW ZEALAND**

**GELED POTTS**

The Accident Rehabilitation and Compensation Insurance Corporation of New Zealand

### **INTRODUCTION**

In 1992 The Accident Rehabilitation and Compensation Insurance Corporation of New Zealand (ACC) became concerned with the rising cost of sport and recreation claims. The purpose of this paper is to describe how ACC specifically developed strategies to target this problem within the high-profile sports of Rugby Union and Rugby League and report on the impact.

### **BACKGROUND**

ACC administers New Zealand's 24-hour, comprehensive no-fault insurance scheme for accident-related injuries. Its objective is to reduce the social, economic and physical impact of personal injury on individuals and the community by:

- designing, implementing and evaluating effective programmes to prevent injuries
- ensuring effective intervention when injury occurs to ensure appropriate treatment is received, and
- working with claimants to help them, where practicable, return to independent living and employment as soon as possible.

ACC is committed to ensuring that the scheme is affordable and sustainable for all New Zealanders who fund it. ACC processes approximately 1.5 million new claims a year of which ninety two percent are minor injuries requiring only basic medical attention, with the remainder involving moderate or serious injuries. At the same time, ACC provides ongoing support to around 135,500 people suffering from injuries which occurred in previous years.

ACC provides support such as:

- retrieval costs by ambulance or air transport from an accident scene
- costs of physical rehabilitation, including hospital treatment, or treatment by medical professionals such as GPs and specialists
- compensation for loss of earnings for the period when people are unable to work because of injury
- personal support to make living with injury more comfortable, such as modification of homes or vehicles, or provision of home help or attendant care.

The services provided to injured people are funded through the premiums paid to ACC. There are five income sources:

- Employers -- who pay a premium based on their total payroll to cover work-related injuries
- Earners -- who pay a premium based on their total earnings to cover injuries to earners outside the workplace
- Motor Vehicle Owners -- through part of the vehicle relicensing fee and a tax on petrol to cover motor vehicle injuries on public roads
- The Government -- which reimburses payments made on behalf of people not earning an income (e.g. children, retired persons)
- Investment -- income earned from the investment of the six months of reserves ACC carries at any one time.

Funding is on a “pay-as-you-go” basis, meaning ACC is required to collect enough money every year to pay all its expenses in that year.

The role of the Injury Prevention Division within ACC is to design and implement cost effective strategies that reduce the incidence of serious injuries, their severity and the costs to premium payers and other New Zealanders. The Division’s vision is for an “Injury free New Zealand”.

## **METHODS**

ACC’s Injury Prevention Division follows a process for developing intervention strategies. The design of initiatives utilises ergonomic and health promotion models including principles of social marketing and health economics. The way each step is implemented varies depending on the particular sector requirements but essentially it is carried out in the following stages.

1. Select a problem that is consistent with the strategic goals of ACC.
2. Analyse the problem through research focusing on the people involved.
3. Conduct a preliminary cost benefit analysis
4. Form a stakeholder group with key people or organisations regarding future involvement.
5. Conduct a more detailed cost benefit analysis.
6. Develop strategies with key partners to ensure action plans are developed.
7. Help partners with implementation.
8. Evaluation.

### **Sport and recreation**

Injury resulting from participation in sport and recreation activities is a major contributor to the overall incidence of injury in New Zealand. ACC provided compensation for over 38,500 claims (16% of all claims) for sporting injury during the 1992 financial year at a cost of \$NZ98 million.

With increased promotion of sport and recreation activities as a preventative measure for many illnesses the incidence of injury is likely to increase over time unless there is effective change in participant behaviour.

### **Why Rugby?**

In 1992 rugby entitlement claims alone cost \$NZ25 million when total sport and recreation costs were \$NZ98 million. Rugby costs were to rise significantly over the next two years to peak during 1994 at \$NZ28 million. The injury contribution made by rugby to ACC’s annual compensation costs accounted for over 25% of compensation cost in sport and recreation though only 5% of the population over the age of 15 years plays rugby.

In New Zealand, rugby is the largest contact sport and is viewed by many as the national game. The number playing is estimated at being between 125,000 and 210,000. Due to its popularity and claim cost it was viewed as the logical sport with which to commence the study of risk factors and preventative mechanisms for sport injury and for developing preventative measures.

Rugby league was also targeted the following year as its injury rate and cost per injury were similar to rugby union. It has approximately a quarter of the players than has union and its cost to the scheme is of a similar proportion. As there are many similarities between the games and their structure it was felt that many of the recommendations established in the rugby prevention programme could be transferred to league.

The goal established by ACC for the programme was “to reduce the cost of rugby-related injury claims received by ACC nationally by 10% over a five year period compared to the 1992 year costs of \$25 million”

There are many challenges in the development of injury prevention programmes in sporting codes. To successfully gain support there are two key issues that must be in place at the outset. Firstly, there must be an assurance that the sport can be played safer in terms of injury severity and incidence whilst avoiding changing the way the game is played. Secondly, ownership of the injury problem must be established. Initially the sports have taken the view that ACC owns injuries, their business is the sport itself. With the culture in both sports being so strong it has taken time to erode this stance. It would be fair to say that there is still a strong “injuries are part of the sport therefore nothing can be done about them” mentality but evidence to the contrary is having gradual impact as the establishment of desirable behaviours are achieved.

The main benefits which have helped to further encourage ownership by the codes are the avoidance of pain and suffering by players, potential to improve the performance of the team and individuals, increased enjoyment of the game improving the public perception with regard to the image of the game, increasing the opportunity to recruit young players ensuring future viability of the game and a reduction in the loss of key players which has impact on the overall team performance.

## **Aims**

In order to provide the prevention programme with a robust foundation a research project was established. Whilst the overall aim of the programme is to minimise the incidence, severity and consequence of injury occurring in rugby, the principle aims of the research project were:

1. To develop a model of sports injury through the identification of risk and protective factors for injury experienced by rugby players.
2. To develop and test a methodology for studying sports injury that is readily adaptable to different sports and other levels of play.
3. To design pilot components of an injury prevention programme, including evaluation, based on the results of the study.

## **Method**

The rugby injury and performance project (RIPP) was established in 1992 to undertake an investigation of the risk factors and protective mechanisms for rugby injury. RIPP was a collaborative effort between the Injury Prevention Research Unit (IPRU) and the School of Physical Education at the University of Otago and was funded by ACC. The research team included injury epidemiologists, biomechanists, sports medicine specialists, clinical and sports psychologists, exercise prescription experts and health promotion specialists.

A total of 356 players participated in the study throughout the 1993 season. The participants were recruited from five clubs and four secondary schools and played the following grades: Senior A, Senior women, senior B, under 21, school boys and school girls. Data were collected from players in three phases: Pre season, using a questionnaire and physical assessment; during the club season using weekly telephone interviews; and post season using questionnaires and physical assessment. Additional information was obtained from coaches by means of a postal questionnaire and through medical records.

## **Results**

The key findings of the initial RIPP data were that;

- Incidence of injury increased with grade. Senior A and Under 21 had the highest rates.
- More than a third (36%) of all injuries in the game were sustained during the tackle or an attempted tackle.
- Injuries as a result of foul play accounted for 13% of all injuries sustained in a game.
- Comprehensive training in the off-season appeared to reduce the risk of injury during the season.
- Prior injury appeared to increase the risk of injury during the season with 42% of players reporting a current injury, chronic injury or both at pre season.
- Quantity and frequency of alcohol consumption put a significant proportion of the players at risk of harm.

## **Stakeholder group establishment**

Once the research had been completed a stakeholder group, Tackling Rugby Injury Panel (TRIP), was established. The group first met in late 1993 and is made up of representatives of various organisations which have a national association with sport. Representatives are from the Hillary Commission (promotion and funding for sport within NZ), Injury Prevention and Research Unit at the University of Otago, Sports Medicine New Zealand, the New Zealand Rugby Football Union (NZRFU) and ACC the funders of the programme.

The Rugby League Stakeholder group is known as the Rugby League Injury Prevention Panel (RLIPP) and was established in 1995. It differs from the RIPP model in that the programme has been agreed as a joint partnership directly between the sporting code and ACC. It is made up of representatives from the New Zealand Rugby Football League (NZRFL), the Hillary Commission and ACC.

The various strategies developed by the stakeholder groups are supported by field staff from both ACC and the sporting codes. Rugby union and league each have development staff located around the country who promote the growth of the sport within their particular regions. They have been trained in the key messages of the programme as well as in the delivery of injury prevention workshops for coaches. Their role is to distribute resources as well as run courses for coaches. ACC Injury Prevention Consultants have taken a support role to ensure that their local Development Officers / Managers can implement the strategies.

## **Programme strategies**

The role of TRIP was, with the support of the IPRU research specialists, to review the results of the research and develop recommendations that would target the areas of high risk within the sport. Twenty three recommendations were developed and are contained within the RIPP report. Strategies were developed as a result of the recommendations being implemented with many of the key strategies being refined and introduced by RLIPP two years later. Some of the key strategies based on recommendations are described as follows;

*Mouthguards.* Compulsory mouthguard use for all players in the 1998 season and onwards was established by both codes. It has been clearly demonstrated in the RIPP research (and league injury reporting system) that up to 30% of injuries in both sport codes are to either the face or head. Strong research evidence indicates that mouthguards not only help protect the teeth, lips, gums and jaw, but also help minimize the risk of concussive type injuries especially those that are transmitted through the jaw.

*Player registration.* The establishment of an accurate player registration system which records age, gender, ethnicity and address is essential if injury rates are to be accurately monitored. As yet there are no accurate player figures and estimates range from between 130,000 and 210,000 in rugby union and between 30,000 and 35,000 in league. The additional benefits of such data would enable individual high risk groups to be targeted directly as well as the anticipation of player trends within the sport. Both codes have yet to apply accurate registration systems. Cost is a factor but sports codes have yet to realise the potential benefits this type of information may have such as anticipating player trends.

*Injury recording.* The establishment of an accurate injury recording system will help encourage ownership of the injury problem by the code rather than maintaining a “head in the sand” mentality. When trends emerge, the sport can then target specific areas for itself. Results also help the sporting codes to keep score. If they have a baseline established then they have a target to work toward or improve on. This appeals to the competitive nature of those involved in promoting the programme. This strategy has yet to be fully embraced by the sporting codes.

*Resource information.* Resources have been developed to target key individuals within the codes namely the players, coaches, referees and club officials.

- Off season guides for players. The RIPP research indicates that conditioning is a major factor in minimizing the risk of injury and that many players do not do enough training in the off and pre season. Many players that do pre season training fail to use a balanced (suppleness, strength, speed, stamina) programme. These results appear to be reinforced by the fact that March and April are the highest injury claims months in both codes which coincides with team trials and the start of the season. The guides have been developed to appeal to players and contain all the key messages for a balanced programme. They have been distributed nationally by Rugby Development Officers / Managers and ACC Injury Prevention Consultants. Press releases, magazine articles and a television advert that runs during mid November encourage players to obtain a copy of the guide and to begin training.
- Coaches guide to injury prevention. Coaches are the key influencers with regard to appropriate injury prevention behaviours. Whilst many active coaches have attended some form of NZRFU coach training, there are many more who are informal coaches and have attended little or no formal training. The purpose of the resources was to support the key messages of the programme and deliver them to this group. The key message was for the coaches to adhere to the model of injury prevention.
- Referees guide to injury prevention. The referees’ control of the game is key to influencing behaviour during play. Referees can minimise the risk of injury to players by ensuring behaviour is closely monitored during high risk phases of play such as the tackle, scrum engagement, rucks and mauls. They also have a major effect on minimising foul play. The guide also provides training tips to ensure that referees minimise the risk of injury to themselves.
- Club officials guide to injury prevention. The purpose of this guide was to raise the awareness of injury prevention within the club management and help ensure that support strategies were in place. It encouraged club officials to provide adequate facilities that support injury prevention.

*Direct training.* Coaches have a major influence on player behaviour and as a result a series of compulsory workshops have been run during the past two seasons nationwide.

- Scrum safety seminars. At the start of 1996 season scrum safety seminars were run. These were implemented by the NZRFU and supported by ACC as a result of an alarming increase in the number of severe spinal injuries resulting from scrum engagements. Scrum engagement laws were also changed for all domestic games in NZ. Essentially the changes had the effect of reducing the impact of the scrums on engagement as the referee would only call the engagement when both packs are ready. All coaches and referees were required to attend the seminars to receive instruction on the correct engagement of scrums.
- Injury Prevention workshops. In 1997 a series of compulsory workshops were held around the country and all active coaches were required to attend. These workshops promoted injury prevention within the sport and each coach was issued with a guide which contained strategies they could implement. The workshops covered safe technique in high risk phases of the game (tackle, scrum engagement, rucks and mauls), the importance of fitness, safety equipment, warming up and stretching, fair play not foul, warming down and stretching, full rehydration, the prompt treatment of injury and full recovery before returning to play. A similar type of workshop was provided for league coaches.

*Media plan.* A series of television adverts were produced to target primarily players. The function of the adverts was to reinforce and support the key messages contained within the resources. The key messages, delivered by a popular ex All Black captain are, when to start off season training, where they could obtain a

player guide, warm up and stretch before play or practice, treat injuries quickly and correct scrum engagement. Media articles in relevant publications throughout the season ensure that the key messages are continually reinforced within popular journals. Posters containing key injury prevention messages are distributed to every club and secondary school by mail or through Rugby Development Managers and ACC Injury Prevention Consultants.

*Coach training resources.* The NZRFU and NZRFL are encouraged to upgrade their coaching information to contain key injury prevention information. Frequently coach training information does not contain specific injury prevention information or is at best limited. Often there is no clear relationship between conditioning and technique which are key components to the prevention of injury, rather than reliance on padding and strapping.

*Sports commentators.* High-profile sports commentators within rugby have attended a discussion session, raising their awareness of the programme. This has helped ensure that during high-profile games commentators comment positively about injury prevention and management rather than glorify players attempting to play on with injury. They support the key messages throughout the season.

## **Evaluation methods**

Several surveys have been used during the course of the programmes to evaluate specific strategies. Whilst each serves a different function some aspects are related which enables results to be cross referenced, ensuring consistency of results. For example, hospitalisation data show a similar downward trend to ACC claims data, the television monitor survey reveals 89% of players have seen the programme television advertisements, 96% of players in the distribution survey claim to have seen the advertisements.

### ***Programme resource distribution survey***

The function of this survey was to measure the effectiveness of distribution networks for resources and activities, perceived changes in behaviour, use of the resources and attitudes toward injury prevention. A sample number of players, coaches, and club officials were surveyed directly by Rugby Development Officers around the country.

### ***Television monitor research***

This research monitored the rate by which the television adverts are watched by rugby players and the population in general.

### ***TRIP evaluation***

The TRIP evaluation had three functions for the rugby programme. They were:

- Monitoring injury rates. An accurate rate of injury needs to be established within sports. Whilst hospitalisation and ACC claims data are available, they do not give an accurate reflection of the true rates within the sports.
- Knowledge, attitude and belief (KAB) survey. This survey monitors the changes in the players knowledge, attitudes and beliefs in regards to injury within the sport.
- Process evaluation. This records and evaluates what has been completed within the programme to measure its effectiveness and reports to stakeholder group.

### ***In-house surveys***

ACC has taken the opportunity to conduct a few specific surveys using 'in house' expertise. The surveys conducted have been;

- Compulsory coach workshop and guide survey. An evaluation of the coach resource and compulsory workshop was conducted towards the end of the 1997 season. The purpose of the survey was to establish coaches' attitudes to the workshops and coach guide. Two thousand eight hundred coaches were mailed a self completion survey form.

- Injury reporting. A system of recording injuries has been piloted during the 1997 league season. Referees were asked to record, on a card, those injuries which resulted in a player leaving the field of play during a game. As the card was pre paid and self addressed, the referee simply has to drop it in their local mailbox. As this is the pilot year there are no comparative data available

### ***ACC entitlement claims data base***

The ACC database records all entitlement claims and their costs. The database does not include minor claims such as single visits to general practitioners. The database is important as it is used within ACC to evaluate programme success in terms of new entitlement claims as well as overall costs to the system.

### **Results**

The scope of this paper does not allow for a breakdown of all survey results rather just an overview of the impact of the programme.

### ***ACC claims data***

- New claims numbers for rugby union and league are at their lowest since the established benchmark year of 1992.
- The cost of new rugby union claims in 1997 reduced by 21% when compared to the benchmark year, exceeding the original goal of 10% reduction within five years.
- Ongoing claims numbers for rugby union and league continue to reduce and are their lowest in the last four years.

### ***Resource distribution survey***

All the indicators of resource distribution show improvements on the previous year. Some key points are;

- 87% of union players surveyed claimed to have done more pre season training for the past season than the season before.
- 84% of union coaches surveyed claimed players in the teams they coached did some form of pre season training this year.
- 79% of union coaches surveyed received a coaches guide to injury prevention compared with 51% from the previous year. Of those, 64% claimed to have put one or more additional injury prevention strategies in place compared with the previous year.
- 99% of the union players surveyed claimed their coach took actions to prevent injuries.
- 72% of union players surveyed claimed their coach encouraged warm downs after practice compared with 50% last year.
- There has been a significant increase (50% compared with 38%) in the proportion of union players claiming there was a soft tissue injury treatment (RICE) kit on hand compared to last year.

As the league programme has just completed the first full year of implementation there is no comparative data available. Results obtained to dated are promising with distribution rates exceeding those of the union programme.

### ***Television monitoring research***

This survey indicates that 83% of the 18-24 year old population can recall seeing the programme advertising, with a further 89% of those who play rugby within the group can recall seeing all of the advertising. Almost all (96%) players surveyed in the distribution survey could recall the advertisements.

### ***Spinal Injury Report***

Since the scrum engagement workshops were held in March 1996 there have been no cases admitted, as a result of scrum injury, at either of the two specialist spinal injury treatment units in New Zealand.

### ***Rugby workshop and coach guide evaluation***

- 92% of participants thought the workshops were useful or very useful.
- 87% of participants rated the workshops as good or excellent based on content, quality, presentation and venue.
- 88% of participants who received a guide thought the layout, content and overall quality was either good or excellent.
- 96% of participants thought the guide was useful and would recommend it to others.

### ***KAB Study***

There is no comparative data available yet to evaluate change.

## **CONCLUSION**

The method of applying injury prevention programmes as described in this paper can have a significant impact on severe injury rates within sporting codes. It can only meet with success if the problem has been clearly identified, multi-level and comprehensive strategies are in place that directly target key participants, funds are available to resource the programme, all strategies are implemented and most importantly the code has the maturity to whole heartedly support and embrace the principles.

The code has to be mature enough to understand the benefits that an injury prevention programme can bring its sport. Significant reduction in the incidence of severe injury can only be anticipated if the programme is encouraged from the top downward, as demonstrated by the scrum safety initiatives.

Due to the strength of the sports culture, programmes must expect slow but lasting changes within the sport. Any organisation investing in such an undertaking must expect to be involved for a minimum of five years to ensure a continued shift toward desired behaviours.

Both the rugby union and league programmes have met with some success whilst only being in place in practical terms for the past two seasons. The cost goal established by ACC has already been exceeded. Should the sporting codes implement all of the recommended strategies this could be even further reduced.