



## INJURIES & DEATHS IN FORESTRY - A N.Z. EXPERIENCE

### A Report by Iain McFarlane, Orthopaedic Surgeon, Rotorua

#### INTRODUCTION

Injuries and fatalities are relatively common in the logging industry, and a concentration of such forest injuries can be found in the central North Island. Rotorua and Tokoroa hospitals treat most patients, Taupo and Whakatane hospitals treat a few, and general practioners treat the remainder.

Over a ten year period (1968-78), 298 forestry injuries and fatalities in the Bay of Plenty region have been studied, with 155 of these having been admitted to hospitals. In New Zealand, 143 deaths caused in the course of forestry work, mainly logging, have also been recorded over a 10 year period (1965 - 1975 latest statistics).

There are indications that a reduction has been obtained in chainsaw injuries by widespread publicity, recognition of the problem, some design improvements, and improved training systems. By applying these principles, further reductions in accidents and deaths in forestry workers should be possible, particularly in the felling phase where most fatalities occur.

#### THE RESULTS OF THE STUDY

Three main categories were evident; those who had sustained fractures and also soft tissue injuries, those who had been injured by chainsaws, and those who had received fatal injuries.

#### FRACTURES

92 patients suffered fractures, the causes of which are outlined in *Table 1*.

|                         |           |
|-------------------------|-----------|
| Falling Tree            | 23        |
| Falling Log             | 43        |
| Falling Branch          | 5         |
| Machinery Injuries      | 11        |
| Falls                   | 5         |
| Motor Vehicle Accidents | 4         |
| Axe                     | 1         |
|                         | <u>92</u> |

Table 1.

Of those who sustained fractures and were admitted to hospital, it is noteworthy that most of the fractures were in the lower leg and

that many of these fractures were of a shattering type. Complications were numerous as might be expected from the crushing type of injury and from the amount of dirt that was frequently in the wound.

Many of the patients had significant late complications such as infection, bone shortening and/or angulation together with delayed or non-union of the fracture. Stiffening of the joint had to be carried out on a number of occasions.

#### CHAINSAW INJURIES

Many of these were minor injuries which were treated on an out-patient basis, but 64 needed hospitalisation.

The chainsaw causes two types of injuries. These are the 'slicing injury' where mostly the chainsaw goes downwards and frequently makes a more or less straight cut often to the leg or foot, and secondly the 'kick-back injury' where the moving saw chain and guide bar tip strike a branch, another log, or some other obstruction and kicks back out of control hitting the operator in the upper limb, around the shoulders, or head and neck. These latter are often the most mutilating wounds.

Of the patients who had been injured by a chainsaw, 14 had open fractures involving the left hand, 18 had soft tissue injuries to the hand with 16 of these affecting the left hand. Partial or total amputation of 9 fingers was required as a result of these chainsaw accidents. Many accidents undoubtedly happened because the operator did not have a firm grip of the saw with his left hand. (See Figure 1.)

Twelve patients had compound fractures of the lower leg or foot.

The chainsaw cuts and chews its way through tissues leaving an appreciable amount of vegetable material and oil and consequently surgery has to be careful. Many of the surgeons close the wounds primarily, carrying out secondary repair of tendons and nerves, but in my opinion the wound should be left open initially, cleaned carefully, hopefully to reduce the amount of infection that is possible, and then closed secondarily at a later date.

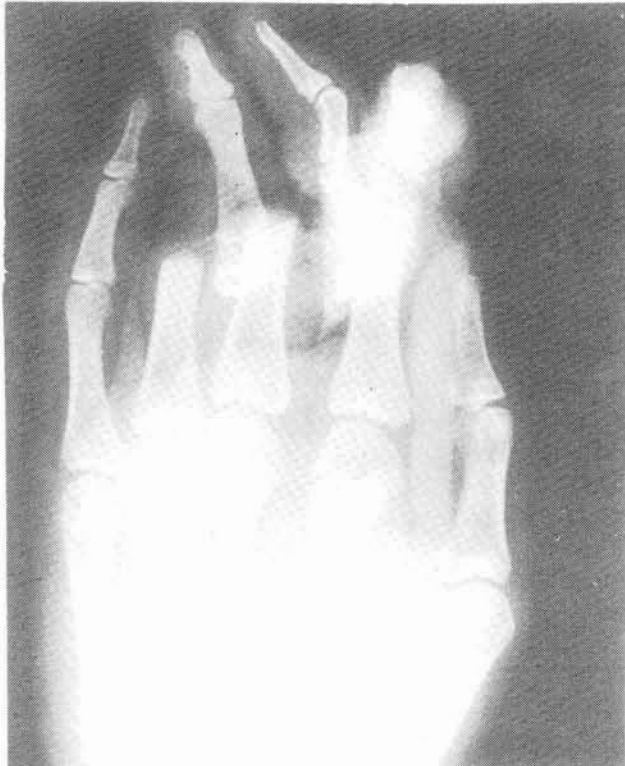


Figure 1. - X-ray of a typical left hand 'kick-back' injury. This could not happen if operator retained a firm grip with the left hand.

## FATALITIES

One hundred and forty-three patients were killed in forestry operations throughout N.Z. in the ten years from 1965-75. The average age was 36 years, and there was no great variation between the different years.

The cause of death is shown in Table 2.

| <u>Cause of Death</u>                           |            |
|---|------------|
| Falling tree                                    | 64         |
| Logs e.g. falling off truck                     | 24         |
| Falling branch                                  | 17         |
| Crush by machinery e.g. log loader, bulldozer   | 11         |
| Fall from a height                              | 4          |
| Flying objects e.g. steel hooks, wire           | 4          |
| Drowning  | 2          |
| Insufficient details e.g. bush-felling accident | 17         |
|   | <u>143</u> |

Table 2.

Of the patients who were killed in forestry accidents, most were killed by a falling tree.

Pathologically speaking, most of the victims were killed by their skull being fractured with usually brain damage, this occurring in fifty-five patients. In another thirty patients, there were multiple injuries, and a further thirty were crushed, usually the chest being crushed.

The geographical location of the number of forestry fatalities on a provincial basis, is shown in Figure 2. The large number of patients killed in the Auckland province reflects the concentration of forestry in the Bay of Plenty region.

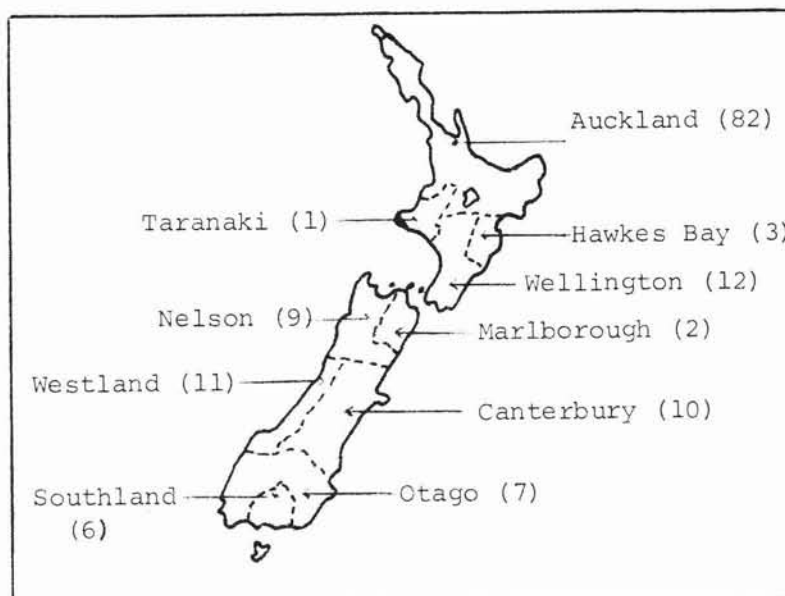


Figure 2. - Number of Forestry Fatalities on a Provincial Basis Over a 10 Year Period 1965 - 1975.

## DISCUSSION

Since early 1976, when we started publicising the effect of chainsaws on patients who were working in the bush and who were injured by chainsaws, there has been a significant drop in the rate of chainsaw accidents. Only two patients were admitted to Rotorua Hospital in the year to 31.10.78 and there is also a very significant drop in those patients who are being treated as outpatients.

## CONCLUSION

Two hundred and ninety-eight patients have been surveyed with regard to severe forestry injuries. To date, as far as can be ascertained, there has been no comparable survey. As there has been a substantial decrease in the number of chainsaw injuries, it is hoped that with sufficient publicity the number of other injuries should also be substantially decreased. Further safety measures may need to be introduced and it is important that there should be worker participation.

Fatalities and severe injuries have been unfortunately common in the logging industry. The treatment of crushing, compound injuries, and chainsaw wounds is complicated by location of the victim at the time of the accident and commonly introduction of dirt into the wounds. To reduce the incidence of accidents increased awareness and better training is required. With some evidence of reduced chainsaw injuries in recent years (through the introduction of better safety measures and training in some organisations, and wider publicity), generally there is an indication that improvements could be effected in a wider range of industry companies and in other areas of forestry as well.

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