A SPORTS INJURY CLINIC : A FIVE YEAR EXPERIENCE.

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This Thesis is dedicated to my wife Pat and my children Andrew, Katie and David.

I wish to acknowledge the help given to me by my Advisers, Mr. James Graham, Orthopaedic Surgeon at the Western Infirmary and Professor Hamish Barber, Professor of General Practice, University of Glasgow, Mr. D. MacLeod, Dr. G. Addis and Dr. G. Murray. I would like also to acknowledge the staff of the Tryst, Recreation Department, Cumbernauld and Kilsyth District Council, especially the Director, Mr. D. MacGown, and the staff of the Clinic, particularly Margaret Ellis, M.C.S.P., Physiotherapist, Mrs. E. Wright for her assistance with record keeping, and Mrs. Isabel Grant and Mrs. Sheena Butler for their secretarial and typing assistance.

SUMMARY:

An account is given of a Sports Injury Clinic operating in a Sports Centre. From its opening in August 1982 to 31st August 1987, 1,417 new injuries were presented at the Clinic. A review of the background to the establishment of such Clinics is discussed.

The numbers attending averaged seven new injuries per week/ per Doctor's surgery, were more than anticipated and caused marked overcrowding problems in the Physiotherapy Department. 23% of all attenders were female. The age distribution of the sportsmen was dominated by the decades 11 - 40, being 86% of the total. 16% of the attendances were for aged 16 and under. The monthly distribution of attendances peaked in August, September and October, with 36% of the total. This was due to the Glasgow Marathon, pre-season training and early season matches causing injury in footballers and rugby players.

The commonest of the 50 different sports whose participants attended were running, football, rugby, athletics, badminton, swimming and squash. Anatomical distribution of injury showed a preponderance of the lower limb, 74% of the total. Knee (26.5%) was the commonest injured part for the first four years overtaken by the thigh in 1986-87.

An interesting aspect revealed was a marked delay in presentation of injury to the Clinic. Only 7% within 48 hours and less than one third were seen within the first two weeks. This seemed to improve with patient education. The injury classification showed that 37% of the injuries were overuse in type and the rest traumatic, mostly in the sporting event 41%, but 9% of the injuries occurred outwith the sporting context.

The two commonest injuries were patello femoral dysfunction which produced 8% of all injuries, mostly runners, and inversion injury of the ankle, 10% of the workload from most sports. A regime of rehabilitation for the ankle involving balance, isometric and dynamic exercises was strongly recommended.

Analysis was made of the seven major sports. An unprecedented expansion in running in Scotland allowed the study of almost 400 Scottish runners. The commonest injuries were patello femoral dysfunction, ileo tibial band syndrome, which appeared unusually common compared with studies elsewhere, the various compartment syndromes in the lower leg, Achilles tendon and foot problems. Elimination of elementary errors such as too much running too soon, poor shoes and inappropriate surfaces were undertaken. Vastus medialis strengthening in patello femoral dysfunction in runners was important. In general, stretching was advocated.

Knee ligament injury was a major feature in rugby and football. A quarter of the athletes presented with hamstring problems - the role of stretching is an important preventative factor. "Swimmers Shoulder", a unique overuse injury was demonstrated in serious Club swimmers. Only 3% of all the injuries required orthopaedic referral via their General Practitioner. A statistical comparison of the injury pattern of the main sports was undertaken.

The main conclusions were that obedience to basic guidelines, adequate training including flexibility, proper equipment (shoe care) will contribute to preventing injury. Adequate muscle rehabilitation is a pre-requisite for prompt and effective return to sport. Future research studies into ankle, knee and hamstring injuries are outlined.

The Clinic has fulfilled the hopes of its founders and justified its existence in the first five years. Development of a national programme is proposed.

INTRODUCTION:

Although the United Kingdom has a long historical tradition of sport with a major influence in the development of Association Football, Rugby Football, Cricket and Athletics, the late 1970's and 1980's have seen an unprecedented growth in sporting activities. It is estimated that twenty one million, five hundred thousand adults participate in sport at least once per month. (1)

A Sports Council Report adds that the United Kingdom spends three point two billion pounds on sport (excluding gambling) making sport a major industry. This figure is more than the country spends on books and magazines, Do It Yourself activities or records and tapes.

The General Household Survey in Scotland in 1983 (2) interviewed adults (over 16 years) asking for participation in sport within four weeks of the interview. Sport was loosely defined, including walking more than two miles, dancing and snooker, but excluding darts and camping. Two point three million Scots claimed they had participated in this four week period. When the activities of walking, dancing and snooker were removed, there were still one point four million participants in what was regarded as being the active sports. (This is an interesting delineation as many people would regard dancing as highly active). This figure represents an increase of 1% compared with 1980 and in the active sports it represented a substantial increase of 11%. Men were twice as likely as women to have participated in the activities, less so when all the sports were included where the ratio was 68/47. Thus sport, and particularly the "active sports" is a regular part of Scots life and that this sporting participation is on the increase.

A more local example of the "Sporting Explosion" is the Glasgow Marathon. In 1981 it was a simple athletics race run with approximately 100 competitors. In 1982, billed as the First Scottish People's Marathon, over five thousand finished the twenty six miles three hundred and eighty five yards. Although the "craze" to run a Marathon has peaked in numbers, there is good evidence that many runners are turning to shorter (and more sensible?) distances.

A major feature of the increased physical activity is involvement of the Government. Through the Sports Councils and Health Education Councils, who have been organizing campaigns such as "Give It A Go" and "Be All That You Can Be" even at all ages, there has been a positive commitment to sport and physical activity. In 1971 the Sports Council produced a report (3) stating "it is undoubtedly true that appropriate exercise can help to avoid hospitalisation and reduce the cost of other services in some cases as well as retaining the services of many individuals as active members of the Community".

The Council argued this, based on studies in the United States, West Germany and elsewhere. By 1984 at the Symposium "Exercise, Health and Medicine" (4) Dr. Smith, Assistant Editor of the British Medical Journal summed up the findings; "the epidemiological and clinical evidence is strong enough for advice to be given to the public with confidence that exercise does protect against heart disease and has a valuable part to play in the treatment of many other conditions - the virtue and value of exercise is now firmly established on the basis of reliable community scientific data".

Important new studies by Paffenbarger (5) into the effect of exercise on the life expectancy of Harvard Alumni, produced clear evidence of an improved life expectancy. This prompted a cynical reply from Jacobi (6) "this meant that if you jogged, you lived for two years longer but had spent it jogging".

At the Commonwealth Conference held in Glasgow in 1986 Findlay et al (7a) showed that in middle aged Glaswegians, training for a Marathon had a beneficial effect on coronary risk factors and that running in a Marathon was not associated with any significant myocardial damage. At the same Conference Mutrie and Knill Jones (7b) described distinct psychological benefits from running, particularly in the over thirty five years age group. Thus, the case for exercise as having a helping role in health, health maintenance and prevention of morbidity, is now virtually proven. The wisdom of the many campaigns are being proven retrospectively.

Unfortunately, exercise is not without its side effects. "Sport for All", the motto of the Sports Council has its corollary "Sports Injuries for All". This phrase was used by Sperryn and Williams in the British Medical Journal as long ago as 1975 (8).

Sporting injuries will frequently present at Accident and Emergency Departments and there have been several studies carried out in this setting. The study at Southampton General Hospital Accident and Emergency Department (9) showed that in 1979 5.4% of all Accident and Emergency attendances and 6.8% of all Trauma attendances were injuries sustained in sporting activity. These patients were mostly male - 358 compared with 61 female. Surprisingly, in the age group under 35, sport was a more common cause of accident and emergency attendance than road traffic accidents. The paper concluded with the statement that a Sports Medicine Clinic was being planned for the General Hospital.

A similar study in Exeter (10) showed that 3.6% of the attendances were related to sport. 84% of them were male. As a result of that survey, a two tier system was set up with a Soft Tissue Clinic on a Monday/Thursday accepting sports injuries referred by either Accident and Emergency Departments or by the patient's General Practitioner.

In a study of the Accident and Emergency Department of the Royal Infirmary, Edinburgh, Waters et al (11) showed, in perhaps the most detailed Accident and Emergency Study of Sport, that sportsmen represented 3.9% of all Casualty attendances there. Football and Rugby Football were the most frequently involved sports comprising 80% of the total. September and February were the busiest months of the year for sporting injuries presenting at the Accident and Emergency Department. The lower limb was the most frequently injured part of the body. In their discussion, the authors state that it is inadequate to exclude a fracture and send the patient home. A much more aggressive approach is almost certainly required to soft tissue injuries.

Earlier in 1975, in the British Medical Journal, an article entitled "Why Sports Injury Clinics" (8) Sperryn and Williams demonstrated the demand for sporting medical expertise. They illustrated the needs of the patients and the skills which were required in such a service. They also commented on the distance that sportsmen will travel for advice. They concluded by arguing for the setting up of suitable departments within the National Health Service at Area and Regional level.

At the same time as Accident and Emergency Departments are recording these figures, sportsmen and sportswomen, during the late 1970's and 1980's have become increasingly vocal in their request for attention to their injuries. These complaints are particularly noticeable and vocal from those who indulge in Running.

Their magazines devote much time and space to articles on fitness and injury with frequent editorials which regularly feature an alleged lack of sympathy and help from the National Health Service. In a "Running" magazine editorial in 1981, the Editor states "A common complaint voiced by too many injured sportsmen is that their G.P.'s are unsympathetic, unhelpful and/or incompetent when consulted about sports related injuries". Further on in the article he states "very often the sportsman is made to feel guilty about his self inflicted problems." This is not the only magazine to make such reports. "Today's Runner", June 1986, in its editorial states "I am always made to feel a bit of a criminal when I see my Doctor". "Because I am a runner I am wasting his time".

"Today's Runner" September 1986, after a vigorous correspondence on the subject quotes from the Editorial, "As a firm believer in the N.H.S. I find it a sad fact that the N.H.S. is insufficient to cater for sports people". "Sport and Leisure" Magazine, which is the "House Magazine" of Sports Centre staff, carried an article stating that the inadequacy of care for sports injuries gives rise to considerable dissatisfaction. This article was, interestingly, written by a Medical Practitioner.

Confirmation of many of these comments were borne out by an article which appeared in the general practitioner newspaper, Pulse, August 21, 1982. The headline stated that £100,000 Sports Injury Clinic had been lying empty for more than a year in /

/in Glasgow because the local Council could not afford to run it. Dr. John MacKay, Chairman of the Glasgow Local Medical Committee said "We feel that sports injuries are something the G.P. can cope with, with the help of his Orthopaedic colleagues. We really do not see this as an important area of General Practice." Dr. W. Fulton, a Local Medical Committee member said "I don't know that it is going to be much use to the General Practitioners in the City". He thought it was an extraordinary decision that the District Council should provide such a project. The contrast between the sporting publications and the Glasgow Local Medical Committee officials is marked and may offer a possible explanation of the sportsman's disappointment. Other evidence of a disinterest in sports injuries is that "Update Magazine", which is generally regarded as being a leader in Postgraduate General Practice, has carried no article on sports injuries in the past five years other than one rather disappointing article on ankle injuries written by an Orthopaedic Consultant. Glasgow University Library until recently, did not carry the British Journal of Sports Medicine. In September 1987 the Princess Royal was quoted as having condemned the medical profession's attitude to sportsmen as consisting of a bandage and an Aspirin.

However, there is some hope. The courses run in Sports Medicine in Scotland and south of the Border have been well attended. The Department of General Practice in the University of Glasgow in its series of lectures for General Practitioners Trainees, now includes an hour and half lecture on "General Practitioners and Sporting Injuries". In the past three years this has been voted one of the most popular lectures in the series "The Young Adult".

One obvious reason for the dissatisfaction demonstrated by the sportsman was contained in a personal view in the British Medical Journal (12) by a Senior Registrar in Orthopaedic Surgery. He wrote complaining that while running a Fracture Clinic, he has less than three minutes per patient - not much time to offer advice and rehabilitation.

In an attempt to offer sportsmen an alternative, many individuals have set up Sports Injury Clinics frequently at a University or as a special clinic of a hospital.

Butler (13) set up his clinic in the University Health Service at Bristol University. The Health Service Building was next door to the Physical Education Department allowing good access to the Gymnasium. Finance was entirely outside the National Health Service.

Iain Adams (14) reported on the Leeds Sports Medicine Clinic which has been active for seven years at St. James University Hospital, Leeds, dealing with 600 patients by referral from their General Practitioner, the Yorkshire Centre of Sporting Excellence and the Medical Officers to official sporting bodies. His complaint was that demand was greater than the ability to provide a service.

Elite athletes have always had an advantage over the ordinary club sportsman and the Injury Service of the Crystal Palace Sports Centre in London has been in operation since 1976 with approximately 500 patients per year (15). Finance was by the Sports Centre's General Fund. A major problem at this clinic was the abuse of the service by a minority of athletes presenting persistently with minor complaints at frequent intervals.

Another University based clinic was established by Gallasco in Manchester (16). This commenced in October 1978 with four clinics per week, staffed by the University Department of Orthopaedic Surgery with a full-time Physiotherapist in attendance. 852 patients were seen in the first eighteen months. The knee and the ankle were the most common areas affected by injury. The article concluded that due to a reduction in University finance, the clinic was scheduled to close in August 1982.

A grant aided clinic during University time has operated at Addenbrook's Hospital, Cambridge (17). In a two year period it saw 1,186 patients of whom 80% were male. The Medical Officer claimed that they had helped to reduce chronic injury and ensure an early return to sport with good preventative measures. The clinic planned to instigate epidemiological studies in Squash and Running.

A unique compromise of N.H.S. style clinic and N.H.S. premises but funded by a Local Authority was reported from Nottingham by Hutson (18). Over 600 patients attended in each of its first two years. Fourth Year Medical Students and Junior Doctors in the Accident and Emergency Department were encouraged to attend.

These documented reports show that clinics were a function of an individual or a small group of individual's enthusiasm. They rely heavily on "grace and favour premises" and are frequently under threat of closure.

One obvious site for such clinics would be a Sports Centre. J.G.P. Williams (19) advocated such centre with a paid Medical Officer, such as a local General Practitioner, Physiotherapist and equipment working on a sessional basis. Such a Sports Centre based service for sports injuries could form a model for the development of such services throughout the country. At the same time, a /

/a report of one such Clinic in Hemel Hempstead was made (20). This was primarily a physiotherapy clinic with G.P. referral and orthopaedic back up. In its first year, 1976, 182 sportsmen attended. The clinic ran in the evening and was increasing its frequency of operation and a further clinic was planned at a nearby Sports Centre.

North of the Border, the original Scottish Sports Injury clinic was at Meadowbank Stadium, Edinburgh. It opened in 1977 (21), its purpose to give advice and treatment to sportsmen and sportswomen of national and international standard, including anyone with the necessary potential to reach these standards. Its aims were to supply Doctors a) to examine before competition; b) to be in attendance at competition; c) to supply facilities for dope testing and sex determination; d) to arrange educational programmes for medical members, coaches and sportsmen. Doctor clinics were started in 1978, two nights per week, with the Physiotherapist in attendance four nights per week. Referrals were accepted from Coaches by the Depute Manager of the Stadium. There was a nominal charge. Lectures in many subjects were held originally. The article also stated that there was a great need for more Doctors to assist.

Later an article appeared in the general practitioner magazine "Pulse", quoting Chairman Peter R. Weston, "that there is a real threat that the Centre may close because of lack of finance and that the problem was that he could not get enough enthusiasm out of the members". (Doctors and other staff.) The failure of Meadowbank to survive as planned, far less to expand and become a Centre for the whole of Scotland, is to be sadly regretted. It demonstrates how much Sports Injuries and Sports Medicine depends on the enthusiastic amateur with medical and /

/and physiotherapy skills supplied as a leisure interest. Recently, however, Meadowbank has had a resurgence in its usage.

The breakthrough for the average Scottish sportsman occurred in 1981. The Scottish Sports Council gave a grant and Fife Regional Council supplied help and premises to allow Scotland's first all embracing Sports Injury Clinic to be opened at the Fife Institute of Physical Education in Glenrothes. This was a major innovation as it was the first time there was major Sports Council and Regional Council involvement in sports injuries. Scottish sportsmen owe much to the pioneers in Glenrothes.

The New Town of Cumbernauld, situated in the Local Authority District of Cumbernauld and Kilsyth, has a large Sports Centre, The Tryst, which opened in 1972.

This is believed to be the busiest Sports Centre in Scotland with over half a million participants per year. In a far sighted move, the Director of Recreation and Leisure, who was also involved in coaching the Cumbernauld Swimming Club Coach arranged for the purchase of an ultrasound machine and for there to be offered a Physiotherapy Service at the Tryst. This was a very informal arrangement on an ad hoc basis. Basically the Physiotherapist, who was a keen Squash Player, attended on Tuesday and Thursday nights and treatment was informal in the Locker Room. This service was not widely known to the sportsmen of the district.

The publicity attending the opening of Glenrothes led to the setting up of a Sub Committee of the Local Sports Council (a representative body of all Sports Clubs in the District with input and finance from the Recreation and Leisure Department of the District Council) to try and establish a Sports Injury Clinic in Cumbernauld. Initially an approach was made to Lanarkshire Health Board to apply for the use of the /

/the Physiotherapy Department of the nearby Central Health Centre in the evening. This approach was politely rebuffed.

The Committee looked for a suitable site and arranged for the creche at the Sports Centre to be adapted so that it could be transformed into the Physiotherapy Department of the Sports Injury Clinic in the evenings. A separate Doctor's Room was provided in a typist's office. A grant was obtained from Cumbernauld Development Corporation, as part of its contribution to Health Week 1982, and this enabled the purchase of equipment, mainly an Ice Making Machine and Infra Red Lamp. The originally purchased Ultra Sound was made available to the Sports Injury Clinic. The Scottish Sports Council then gave a grant which allowed the purchase of an Interferential machine and a Transcutaneous Nerve Stimulator slightly later. A meeting of all local Sports Clubs was called at which the Administrator and Medical Officer spoke outlining the plans and the service they intended to offer. A similar meeting was held with local General Practitioners. There was an article in the local newspaper but most initial publicity was via the sporting Clubs.

The Clinic opened for business in 1982. The Doctor's surgery was scheduled for a Monday night and physiotherapy sessions on Monday and Thursday nights. A third physiotherapy session was felt to be desirable but could not be staffed adequately. In 1987 a further grant, this time from the profits of a Half Marathon held in the town, (the medical cover for which was supplied by the Clinic) allowed the purchase of a short wave diathermy machine.

The Clinic is administered by a small Sub Committee of the local Sports Council, including the Secretary of the Sports Council, (a Council employee) the Manager of the Tryst, the /

/the Director of Recreation and Leisure (as a representative of the Swimming Club), the Assistant Director of Recreation and Leisure, the Sports Development Officer, the Doctor, the Physiotherapist and two members of local Clubs who are usually the Receptionists at the Clinic. This Committee meets quarterly and makes decisions regarding financing, charges and purchase of equipment. The Committee is answerable to the local Sports Council and therefore the Clinic is essentially run by sportsmen for sportsmen.

The Clinic has run continuously since August 1982 and this is a report of its first five years.

METHODS

All the patient's history, examination and data were recorded on simple Record Cards. The cards used throughout the five years of this study are shown in Appendix 1.

The patient completed the upper part of the card with Name, Address, Occupation, Age and Sport on all the cards used. The name of the patient's General Practitioner was usually recorded either on the card or on a specifically prepared cyclo-styled letter prepared by the Reception Staff.

Card A was the initial card based on that used at the Fife Institute in Glenrothes and contained space for reference, place of injury and other aspects, on its right hand side. The Physiotherapist used the back of the card to record her treatments and the Doctor, any follow-up comments.

The place of injury was not fully utilised and when the card was re-designed in 1983 - Card B - this space was abolished and the opportunity used to increase the space available for history and examination. This was specifically at the request of the Medical Officer. Unfortunately, the diagnosis box at the right hand side was omitted, thus making any instant check of diagnosis difficult, hence the pen drawn box on Card B. This card was used successfully until 1986.

The Scottish Sports Council's Consultative Group on Sports Medicine and Sports Science produced a prototype standard medical card - Card C. This

/required more patient input which was completed to a varying degree, contained more information of a research nature, but had very short space for history and examination. When the trial of the Scottish Sports Council's card was completed, many of the aspects of this card were introduced to the Tryst's own card and a reasonable compromise achieved - Card D, which was used from 1987 onwards.

Finally, although started after the five years of this study, the Scottish Sports Council now have their study fully operational. This will be discussed in the conclusion section and Card E and Form F, are now used at the Tryst. This was commenced on 1st September 1988. The first copy of the Form F is sent to the Scottish Sports Council and the other copies remain at the Tryst, along with the basic card. This has caused a slight storage problem, i.e. they have to be stored separately at the moment, but they offer the ideal compromise permitting epidemiological research and practical history taking and examination recording.

At the end of each quarter of the year, the Medical Officer analysed all the records, allocating a Clinic Number (top right hand corner usually) and recorded number, sex, injury, sport and source of referral in a Royal College of General Practitioner E. Book. These elementary figures form the basis of the Annual Report of the Clinic to Local Sports Council and Recreation and Leisure Department.

The detailed analysis for this thesis was made by the Medical Officer reviewing all the cards and recording the figures manually. A minor problem in recording figures on an annual basis was that the Clinic opened on the third Monday in August for local administrative reasons and that the pent up demand distorted the first two nights of attendance. Thus, to obtain a realistic comparison between the years, the Clinic year was deemed to run from 1st September until 31st August inclusive. Hence, in Table 1 and subsequent Tables, August 1982 is shown as a separate entity.

The problems involved in designing and maintaining records have now been overcome and the current use should continue for the foreseeable future. The Sports Council forms will also help to establish an excellent data base for future research in sports injuries in Scotland.

RESULTS, ANALYSIS AND DISCUSSION:

TABLE 1 USAGE

The total number of patients attending the clinic was larger than estimated by the Planning Committee. An estimate of five new injuries per Doctor night giving a total somewhere between 150 and 200 in the first year had seemed a reasonable estimate in planning the Clinic.

Although the studies previously mentioned had larger numbers, Leeds 600 per year (14), Crystal Palace 500 per year (15), Manchester 500 per year (16), Cambridge 550 per year (17), and Nottingham 600 per year (18), these were all much larger clinics in terms of space and population served and functioned for a greater number of hours than Cumbernauld. The Sports Centre Clinic in Hemel Hempstead (20) had 182 in its first year and this seemed more compatible with the Tryst.

In Cumbernauld and Kilsyth there is good primary care access to physiotherapy clinics with both towns having Physiotherapy Departments running a Recent Injury Clinic (injuries less than five days old) with direct access from the General Practitioner. Therefore, in theory, the sportsman should have been receiving a reasonable service from the National Health Service.

The numbers experienced in the first year of the Clinic's existence, over 300 in total, i.e. seven new patients per Doctor night, presented major problems. In particular, the problem of overcrowding in the Physiotherapy Department has been an ongoing major worry. To counteract this the Doctor became more involved in muscular rehabilitation aspects of treatment than his traditional role; handout written instructions were freely given at the Clinic and access was obtained to the Conditioning Gym of the Sports Centre on a Thursday night when the Physiotherapist /

TABLE 1 USAGE

	Aug 1982	1982-83	1983-84	1984-85	1985-86	1986-87	TOTAL
SESSIONS	2	45	45	46	41	37	216
NUMBERS	21	326	303	294	247	226	1417
AVERAGE NO. AT SESSION		7.2	6.7	6.4	6.0	6.1	6.56

/Physiotherapist was liable to be quieter as there were no new patients referred from the Doctor.

The number of new patient attendances declined from just over 300 in 1982-83 to just over 200 in 1986-87. This represents just one patient less per Doctor session. This decline in numbers was caused by several factors. There was a decline in novelty value. The Clinic had a reduced profile and publicity after its opening. The Clinic has had no further publicity at all in any sense other than a celebration of its One Thousandth patient. Sports Injury clinics opened in Stirling, Blantyre, Monklands, Glasgow and a Runners Clinic operated under the aegis of the School of Chiropody. There was also a decline in the numbers of runners and running injuries (q.v.) and finally, there was the possibility that there might have been an educational spin-off in the prevention of injuries that the patients had learned from their previous attendance at the Clinic.

The 1417 new injury attendances represent 1078 individuals. While many of these sportsmen now have clinics nearer their home or may be seeking advice elsewhere or have even given up their sport, there are perhaps some whose injury numbers have been significantly reduced by education at the Clinic. Ideally, the 37.5% injuries which are overuse in nature, i.e. due to the repetition involved in their sport, are preventable as is some of the trauma.

The busiest individual session saw 16 new patients in one night (after this night the number of new patients was limited to 12) and on the quietest night, there was one new patient. Although 1078 individuals have used the Clinic, there were several regular attenders which included 15 new injury visits by a male runner, 9 new injury visits by a female runner, 8 by a female runner, 6 by a male runner and 6 by a female handball /

/handball player.

The decline in the number of sessions held represents a decline in the Medical Officer's dedication in that in the later years he ceased to work during his holidays. The large numbers attending the Clinic (certainly the largest Scottish study of pure sporting injuries) allows patterns to emerge and lessons to be learned.

TABLE 2 SEX DISTRIBUTION OF PATIENTS

The total number of sportswomen attending the clinic was 327 which represented 23% of all attendances. The figure varied very little from year to year. The Accident and Emergency studies previously mentioned showed a female attendance of 16% in Exeter (9), 14.5% in Southampton (10) and 12% in Edinburgh (11). The Exeter group commented that there was a large number of horse riding injuries amongst the young females in their study. The Sports Injury Clinics showed a 20% female attendance in Cambridge (17) and 18% in Nottingham (18). Both of these studies were in the late 1970's and early 1980's and perhaps the slightly higher number in Cumbernauld represents an expansion of female sporting interest. Certainly the low casualty attendances reflect that the major trauma sports of Association and Rugby Football have at the moment minimal female participation. In Cumbernauld, although the Ladies Football Team are regular users, reflecting a technique problem particularly in avoiding the foul tackle, they were markedly outnumbered by the large numbers of males from these sports.

The study by Dunfermline College of Physical Education in Edinburgh for the Scottish Sports Council (22) showed that for every 65 men participating in sport in Scotland, there were 35 women. The favourite female sporting activities were listed as being /

TABLE 2 SEX DISTRIBUTION

	Aug 1982	1982-83	1983-84	1984-85	1985-86	1986-87	TOTAL
TOTAL	21	326	303	294	247	226	1417
MALE	15	253	235	223	196	168	1090
FEMALE	6	73	68	71	51	58	327
PERCENTAGE FEMALE		22.4%	22.4%	24.1%	20.6%	25.6%	23%

TABLE 2 - SEX DISTRIBUTION

/being swimming, walking and keeping fit. This study, if accurate, contrasts with the Tryst's experience of the injured female and suggests that the female is less likely to be injured than the male. One particularly pleasing aspect of female participation in sports is that the current "Aerobics Boom" does not seem to be producing injuries that will present at an injuries clinic. There are several aerobic groups in the District. The town of Kilsyth has one group averaging over 100 attendances per week during the three years it has run and two smaller sub-groups also in the town. There are several large aerobic groups in Cumbernauld, the latest being run at the Tryst itself, with well over 100 attenders in one night. Yet, as is shown in Table 7B, "Keeping Fit" and "Aerobics" between them produced only 11 injuries. Local General Practitioners state they have not seen many injuries from the aerobics boom either.

There was no significant difference in the injury pattern within the sports between the sexes though the clinic has yet to meet an injured male dancer.

In conclusion, the percentage of those injured who were female was higher than recorded elsewhere and may represent an increase in female participation in sport in recent years, but this would need confirmation from other studies and is offered only as a tentative suggestion.

TABLE 3. SOURCES OF REFERRAL:

Since the clinic did not seek to offer open access to all, as there might be scope for an ethical clash with General Practitioners and as the clinic only desired to attract bona fide sportsmen, a system of referral was initiated. The patient either attended through their Club, or if involved in solo sports, via the Sports Centre Management who checked on those making appointments. Two individuals did arrive unannounced without an appointment, and although they were not turned away, the policy of referral was made clear.

Most of the attendances, 51.1% came from the Clubs, with the Sports Centre Management contributing 43.7%. Some General Practitioners referred by letter but this was a function of initial publicity or a special interest of the individual General Practitioner. Many Practitioners encouraged their patients to attend or accepted their attendance without formal letter of referral. Schoolteachers, particularly Physical Education Teachers, provided a small number as did one knowledgeable Casualty Officer.

In summary, the main two sources of referral were the Clubs and Sports Centre Management.

TABLE 4. AGE DISTRIBUTION:

The ages of the patients attending the Clinic were recorded by the patients themselves - see cards Appendix 1 - unfortunately not all patients completed this aspect. The main decades were 11 - 20, 21 - 30, 31 - 40, which comprised 86% of the total attendances. There was a fair percentage of injured sportsmen outwith these age groups. The only other studies which have recorded a pattern were those of the Edinburgh Accident and Emergency Study (11) which recorded 52% under 21 and 97% under 40; and the Cambridge University Study (17) which was essentially University orientated with only 19% over 26 and 6% under 16 years.

TABLE 3 SOURCES OF REFERRAL

	Aug 1982	1982-83	1983-84	1984-85	1985-86	1986-87	TOTAL	%
CLUB	15	193	155	125	125	117	730	51.5
SPORTS CENTRE MANAGEMENT	1	105	137	164	106	106	619	43.7
G.P.	4	19	9	5	13	3	53	3.7
SCHOOL	1	5	2	0	3	0	11	.8
HOSPITAL	0	2	0	0	0	0	2	.15
SELF	0	2	0	0	0	0	2	.15
TOTALS	21	326	303	294	247	226	1417	

TABLE 3 – SOURCES OF REFERRAL

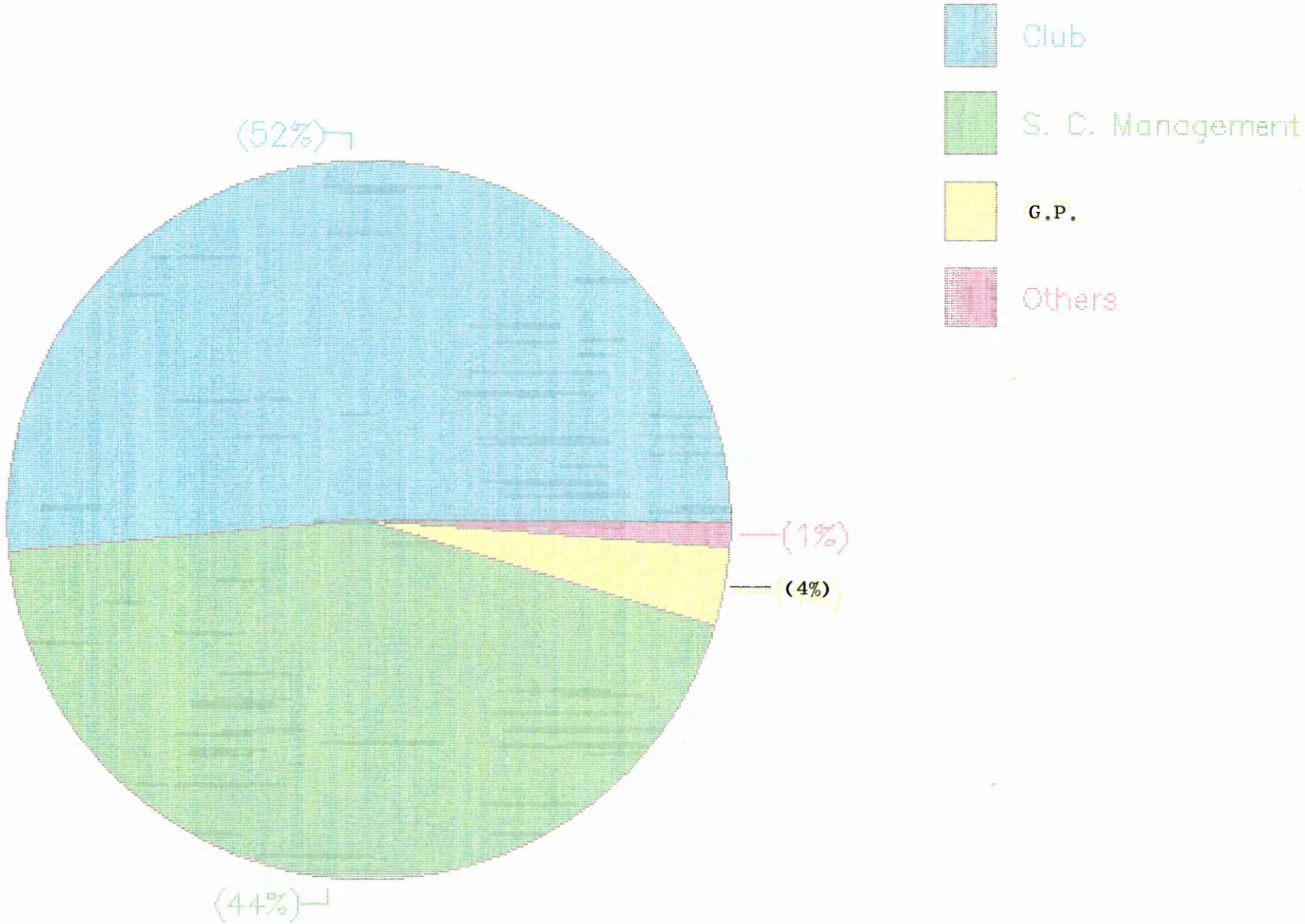
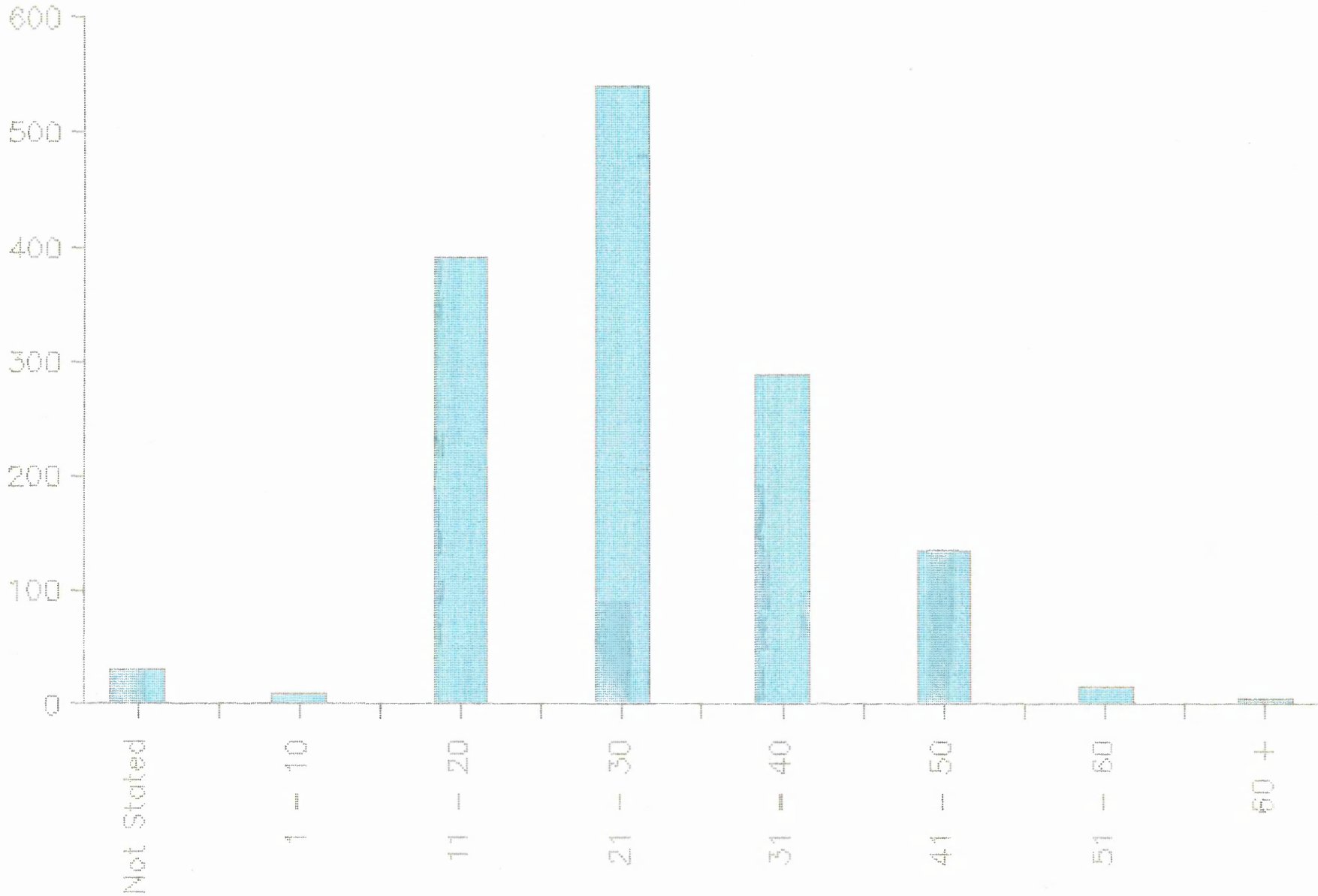


TABLE 4 AGE DISTRIBUTION OF PATIENTS

AGE RANGE	NUMBER	%
Not stated	30	2.2
1 - 10	9	0.6
11 - 20	391	27.5
21 - 30	540	38.1
31 - 40	290	20.5
41 - 50	135	9.5
51 - 60	16	1.2
60 +	6	0.4
TOTALS	1417	100%
1 - 16 inc	228	16%

TABLE 4 – AGE DISTRIBUTION OF PATIENTS



The fact that 228 (16%) attending at the Cumbernauld Clinic were aged 16 and under has implications not only for the financial aspects of the clinic, as these sportsmen are by definition not earning, but also puts a large area of responsibility onto the shoulders of parents and coaches. This was generally sensibly borne but there were a few examples of over zealous parents or over zealous coaches but in the main, common sense and the desire to protect the child were the dominating features.

Judging from the limited comments of the other two studies, (Edinburgh Accident and Emergency and Cambridge University) there were perhaps more older patients attending the Cumbernauld Sports Injury Clinic or perhaps the older sportsman is less likely to need Accident and Emergency attention when compared with his younger counterpart who may be participating in more traumatic sports.

TABLE 5. EMPLOYMENT STATUS:

As a fee charging clinic (albeit modestly - the maximum fee which was for someone from outside Cumbernauld and Kilsyth District was £5 to see the Doctor) it was important to note the percentage of students, unemployed and housewives attending the Clinic. Cumbernauld and Kilsyth District Council have a policy of subsidising sporting activities for the unemployed. Occupation was also recorded as it may well have a potential relevance to the injury or to the treatment. Occupation was recorded by the patient completing this section of the record card.

Unfortunately, it is a sad sociological commentary on contemporary Scotland that while the Student/School percentage is reasonably accurate, the unemployment statistic is false. Many patients filled in a stated occupation on the form, but on questioning later, particularly by the Physiotherapist, admitted they were not actually in /

TABLE 5 STATUS OF PATIENT

	NUMBER	%
School/Student	321	22.7
Unemployed	54	3.8
Employed	989	69.8
Housewife	24	1.7
Pensioner	2	0.1
Not stated	27	1.9
	1417	100%

/in unemployment at that time. Many of those people who recorded that they were unemployed on their record card, were youngsters who had never worked at all. It is an interesting aspect of many sportsmen's dedication to their sport that many people who were not earning were prepared to pay the fees required by the Clinic. It is also an indication that the National Health Service, free at point of contact, does not offer the sportsmen the service that they seek.

TABLE 6. MONTHLY PATTERN OF USAGE:

August, October, September were respectively the most popular months for attendance. These three months provided 35% of the total attendance at the Clinic. This was directly related to the running of the Glasgow Marathon at that time of year and to pre-season training and early season matches in Rugby and in Football. The months with lowest attendances were December, a month dominated by Christmas in terms of attendance, the first fortnight in January when the Tryst closed for refurbishment and July when the Doctor and Physiotherapist took their annual summer holidays.

TABLES 7A and 7B SPORTS:

When planning the Sports Injury Clinic in 1980-81, the sub committee estimated that football would be the main user of the Clinic. Then in 1982, the first Glasgow People's Marathon was finished by over 5,000 runners. Running in the past decade has grown from a small enthusiastic minority activity to a popular hobby involving all shapes, sizes and ages. Despite the reduction in numbers participating in the Glasgow Marathon there are still many people running for either fitness and health or to participate in shorter distance races. However running, and particularly training for /

TABLE 6A MONTHLY DISTRIBUTION

YEAR	TOTAL	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
1982	21												21
82-83	326	36	34	35	11	25	22	24	23	41	28	0	47
83-84	303	24	39	25	16	18	31	24	29	25	13	26	33
84-85	294	40	39	23	5	22	28	22	22	28	19	10	36
85-86	247	29	32	19	15	19	25	27	22	10	17	6	26
86-87	226	23	19	30	9	9	17	16	24	16	22	0	41
	1396	152	163	132	56	93	123	113	120	120	99	42	183

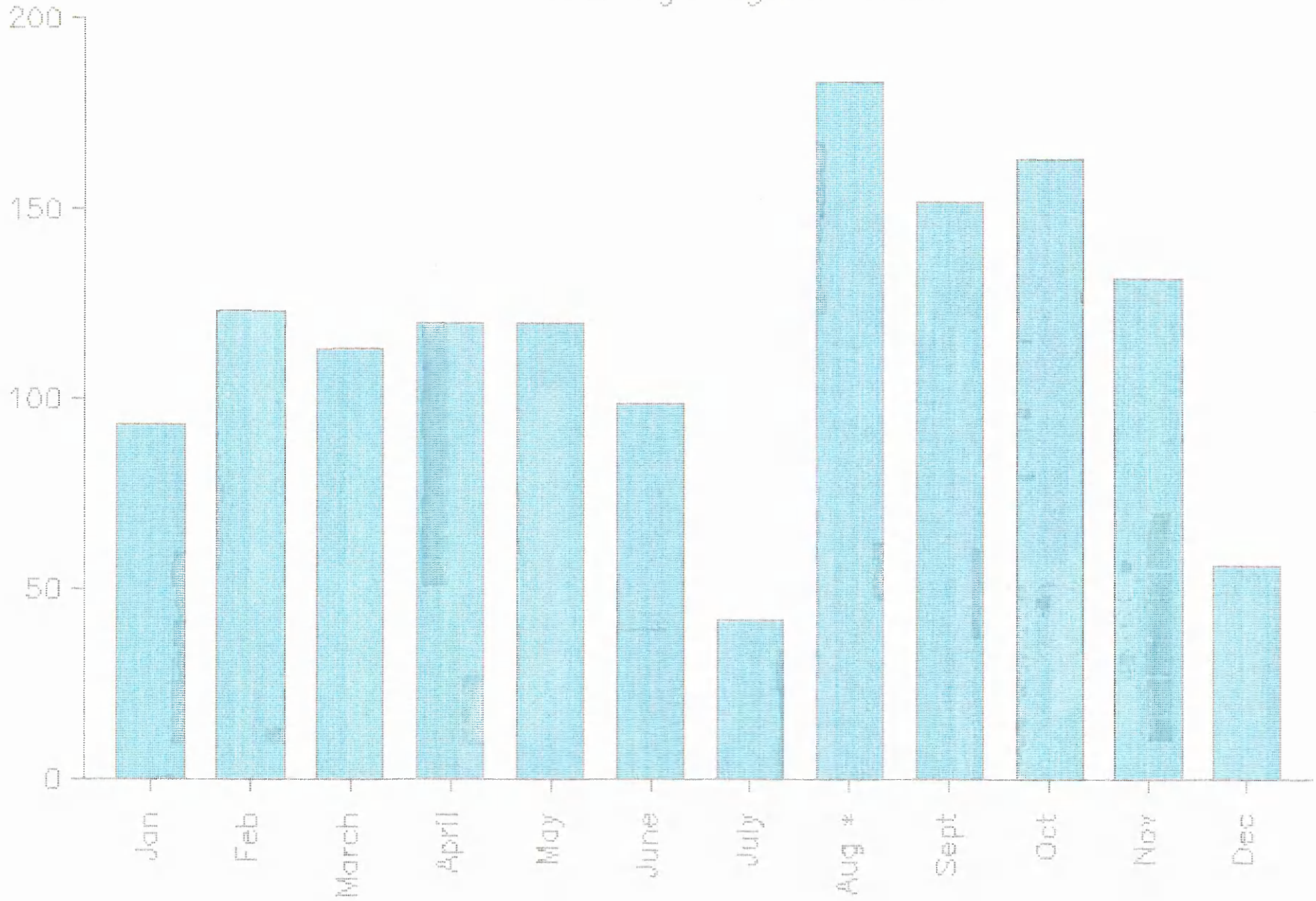
TABLE 6B TOTAL MONTHLY ATTENDANCES

AUGUST	183*		
OCTOBER	163	498	36%
SEPTEMBER	152		
NOVEMBER	132		
FEBRUARY	123		
APRIL	120		
MAY	120		
MARCH	113		
JUNE	99		
JANUARY	93		
DECEMBER	56		
JULY	42		

*Excluding August 1982.

TABLE 6B – TOTAL MONTHLY ATTENDANCES

* Excluding August 1982



/for the Marathon, seems to produce a disproportionate number of injuries, particularly in the novice. In the first few years runners, defined as those wishing to run for at least 5K, provided over one quarter of those attending the Clinic. These numbers are declining and the reason for this is discussed in the analysis of Running Injuries (q.v.). Finally in 1986-87, footballers had become the predominant sport contributing attendances at the Clinic.

The variety of sport (50 in all) has been astounding, even allowing that the top 20 sports produced 93% of all attendances. There were no major surprises in the top 20 sports other than that of Handball. One of Scotland's few Handball Clubs is based at the Tryst and it is a large and highly successful Club.

In recent years, 1984-87, several Dance Classes and Studios have discovered the existence of the Sports Injury Clinic.

The studies previously mentioned have analysed the sports which produced the injuries showing the following patterns. The Edinburgh Accident and Emergency Study (11) was heavily dominated by football with 41% and Rugby with 23%. Interestingly, jogging as they describe it, contributed only 1%. The year of this paper was 1980-81. Since most football and rugby injuries are traumatic in nature and since running injuries tend to be of an overuse nature, one would expect a relatively lower presentation of runners at an Accident and Emergency Department.

The Manchester University Study (16) in 1979 found that its main sport was football with 30.2% followed by rugby with 24.4% and no mention at all of running and jogging as a separate entity. Cambridge University (17) in 1981-82 was still dominated by football with 19.4%, rugby 16.4% and also rowers but it presented a much more varied picture and recorded 5.6% for long distance runners.

TABLE 7A SPORTS (50)

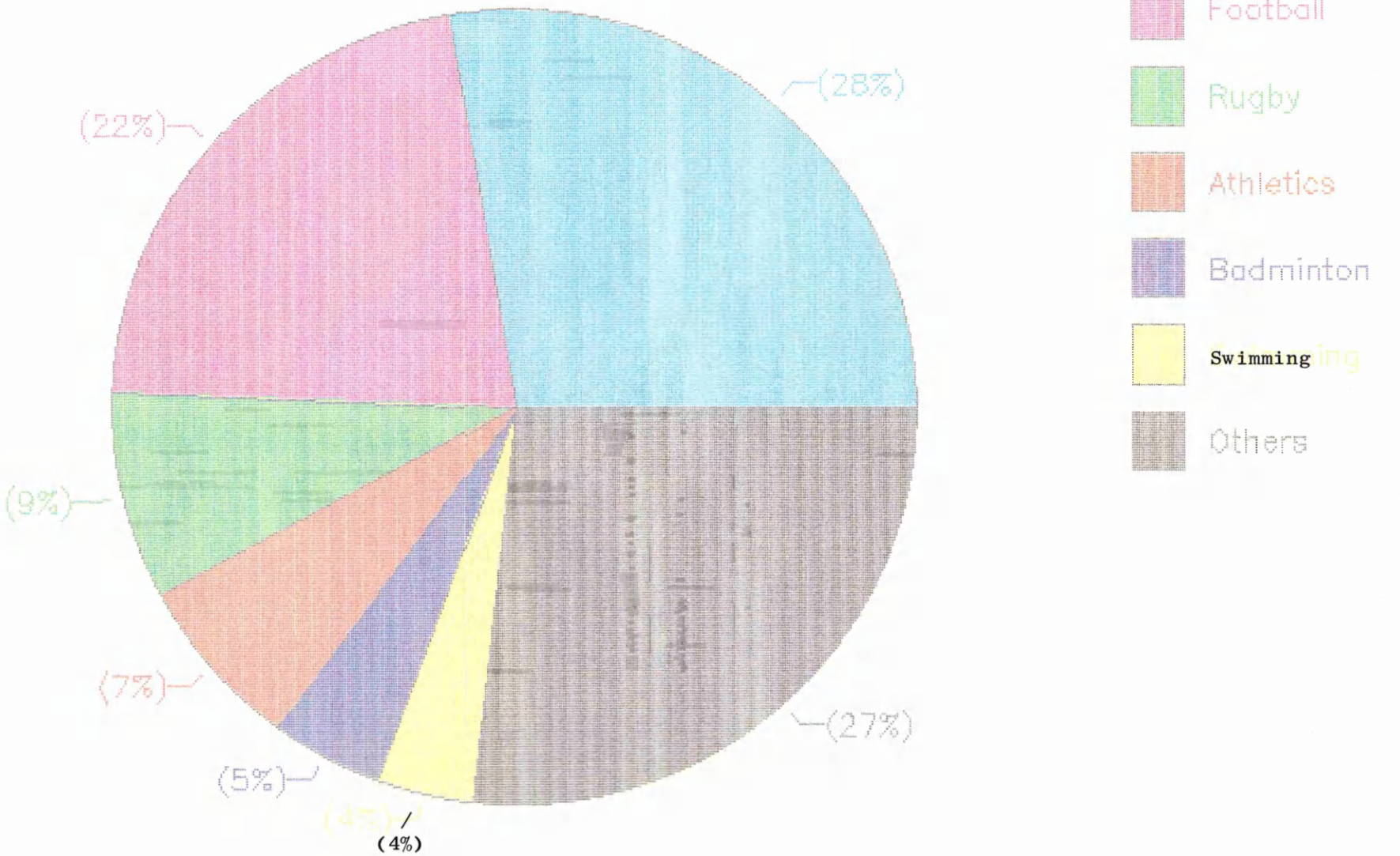
TOP TWENTY SPORTS YEAR BY YEAR

SPORT		Aug 82	1982-83	1983-84	1984-85	1985-86	1986-87	TOT
1.	Running 5K+	6	79	110	86	71	40	39
2.	Football	4	74	49	62	62	57	30
3.	Rugby	3	38	33	18	17	12	12
4.	Athletics	0	15	21	16	13	33	9
5.	Badminton	0	16	14	19	9	6	6
6.	Swimming	1	14	6	20	9	4	5
7.	Squash	1	17	4	7	8	12	4
8.	Martial Arts	0	9	11	8	4	8	4
9.	Gymnastics	5	9	10	3	4	2	3
10.	Handball	0	14	8	3	3	4	3
11.	Judo	0	10	6	3	6	2	2
12.	Golf	0	0	2	3	4	9	1
13.	Dance	0	0	0	7	2	9	1
14.	Weight Lifting	0	6	5	3	1	1	1
15.	Ski-ing	0	0	0	3	8	4	1
16.	Wrestling	0	3	2	5	2	1	1
17.	Cycling	0	5	2	1	3	1	1
18.	Hockey	0	3	1	2	0	2	8
19.	Hill Walking	0	0	1	2	3	1	7
20.	Weight Training	0	0	0	0	2	4	6
								1331

TABLE 7B REMAINING SPORTS

		TOTAL
21.	Keep Fit	6
22.	P.E. Teacher	6
23.	Basketball	5
24.	Tennis	5
25.	Aerobics	5
26.	Tri-athlon	4
27.	Volleyball	4
28.	Bowling	4
29.	Cricket	3
30.	Life Saving	3
31.	Trampoline	3
32.	Boxing	3
33.	Sailing	3
34.	Mountaineering	3
35.	Canoeing	3
36.	S.C. Employee	3
37.	American Football	3
38.	Curling	2
39.	Rowing	2
40.	Archery	2
41.	Body Building	2
42.	Majorettes	2
43.	Ice Skating	2
44.	Baton Twirling	2
45.	Wind Surfing	1
46.	Highland Dancing	1
47.	Board Sailing	1
48.	Netball	1
49.	Rock Climbing	1
50.	Bowls	1

TABLE 7A - SPORTS



It would be very interesting to speculate if these Clinics (if they have survived) have experienced the "running boom" in a similar manner to Cumbernauld.

At Monklands Hospital, Lanarkshire a Sports Injury Clinic is run by an Orthopaedic Surgeon as a special interest. It operates by General Practitioner and Accident and Emergency referral (23). During the years 1981-82 its attenders were 45% footballers, 16% rugby players and 15% runners.

The epidemic of running injuries was a novel experience in the Sports Injury world and this is reflected in the paucity of advice in many of the older textbooks.

TABLE 8. ANATOMICAL DISTRIBUTION OF INJURIES:

As Table 8 demonstrates, three quarters of the injuries occurred in the lower limb. The knee is the main site with 26%, followed by the thigh with 17%, the ankle and Achilles tendon 16.4% and calf and shin 8.4%. This pattern was fairly consistent over the five years of the Clinic with a slight increase in thigh injuries in 1986-87, due to an epidemic of hamstring injuries, particularly among the newer Athletic Clubs such as Cumbernauld Amateur Athletic Club and Kirkintilloch Olympian Amateur Athletic Club. The hamstring epidemic also reflected better use of the Clinic's facilities by junior and amateur football clubs.

Similar patterns of injury were reported in other studies. In the Manchester University study (16) lower limb injuries were reported in 65% and in the Edinburgh Accident and Emergency study (11) the incidence was 49%. The percentage of knee injuries at Monklands Hospital (23) was 43% and in Manchester (16) was 24%.

Thus, the Tryst experience agrees with the other studies concerning the lower limb domination of sports injuries.

TABLE 8 ANATOMICAL DISTRIBUTION OF INJURY

	Aug 82	1982-83	1983-84	1984-85	1985-86	1986-87	TOTAL	%
Shoulder	1	17	10	12	20	9	69	4.9
Rest of Arm	1	19	25	24	8	10	87	6.1
Neck	2	3	7	6	5	6	29	2.0
Back	1	35	39	31	20	25	151	10.6
Thighs	4	47	42	47	42	59	241	17.0
Knee	6	89	82	88	67	44	376	26.5
Calf and Shin	1	37	26	22	22	10	118	8.4
Ankle and Achilles	3	56	42	40	44	46	231	16.4
Foot	1	19	18	20	11	8	77	5.4
Other	1	4	12	4	8	9	38	2.7
	21	326	303	294	247	226	1417	100.0

TABLE 8
ANATOMICAL DISTRIBUTION OF INJURY

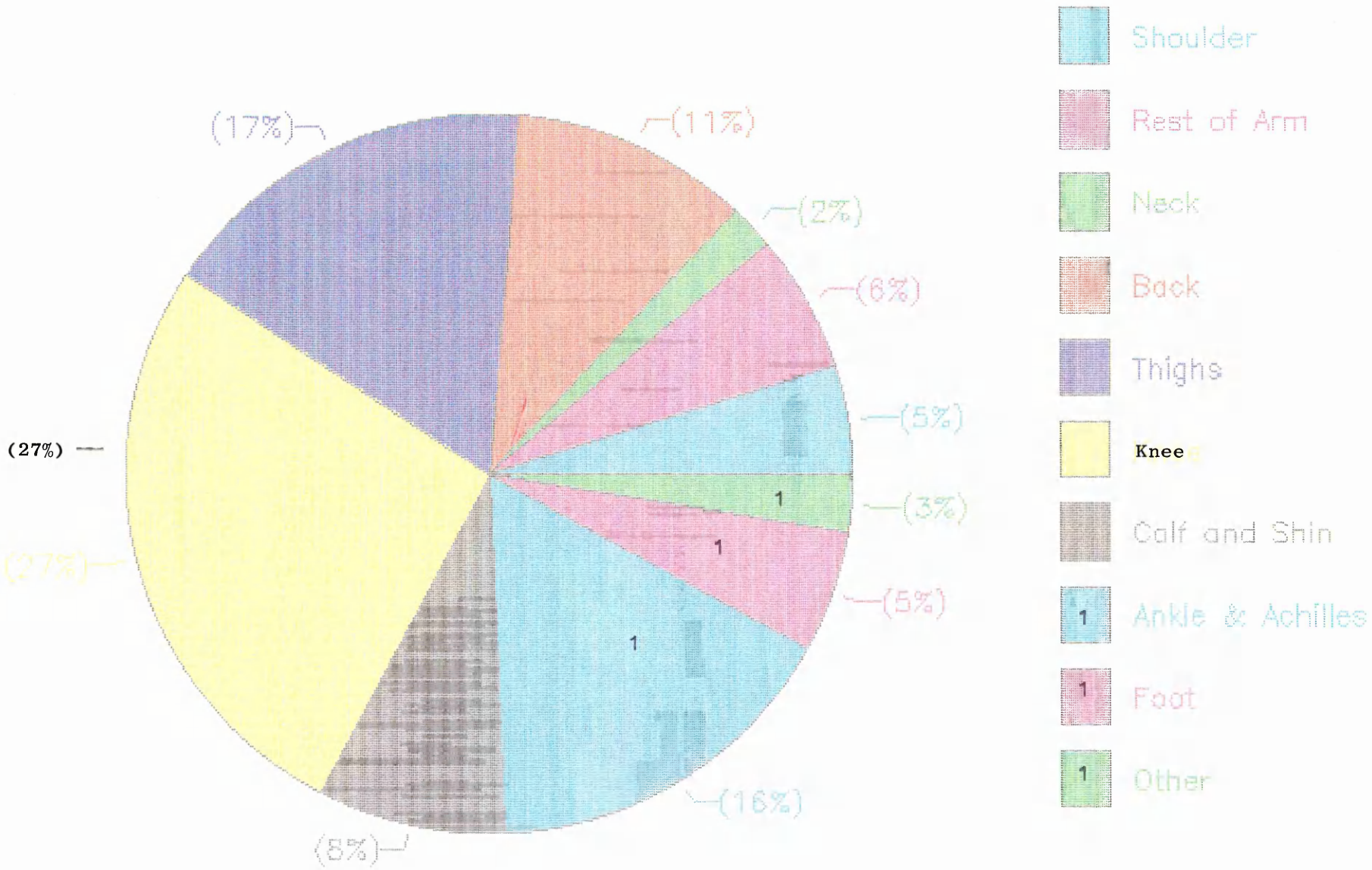


TABLE 8

ANATOMICAL DISTRIBUTION OF INJURY

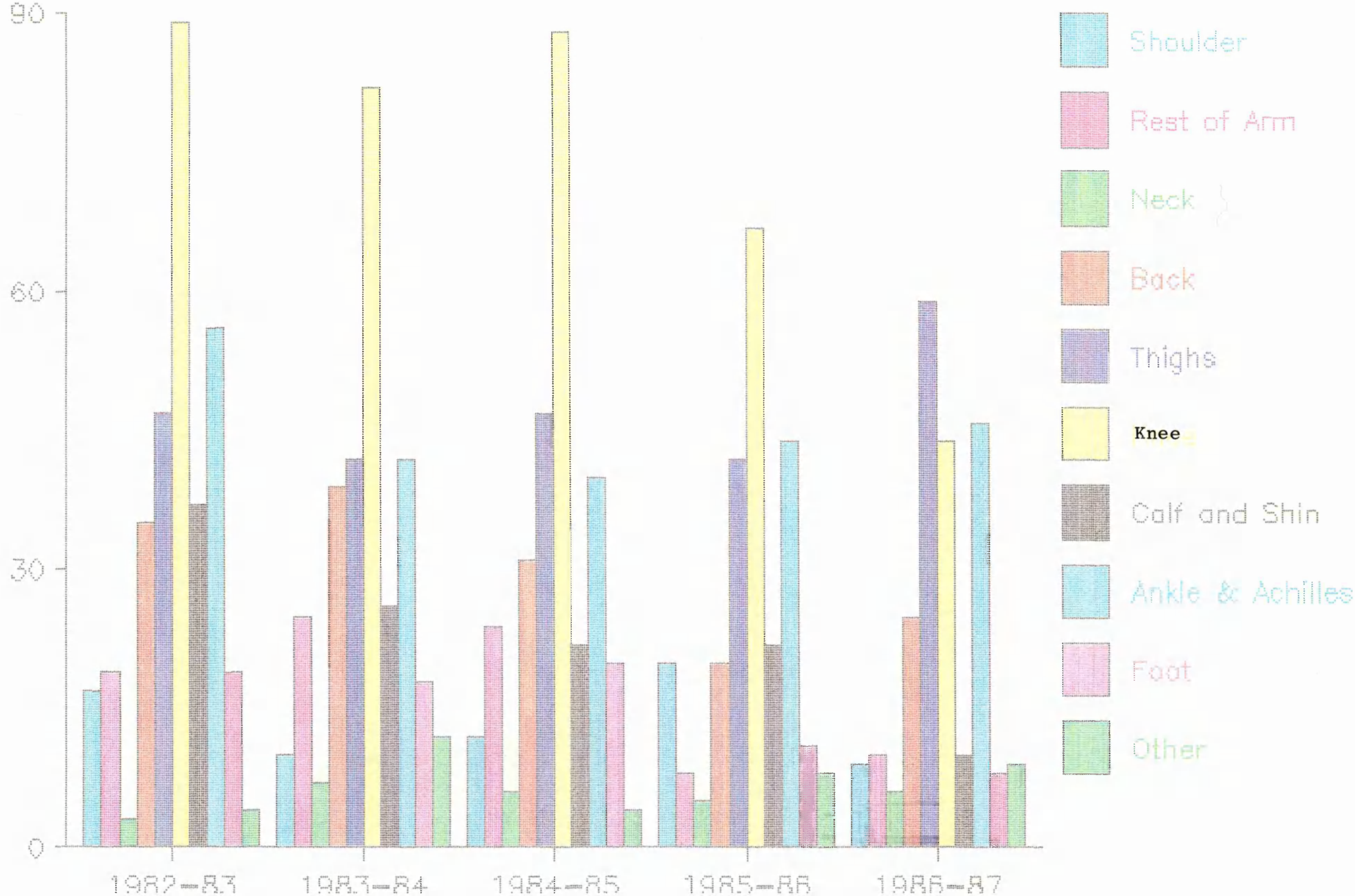


TABLE 9 TIME BETWEEN INJURY AND PRESENTATION:

On choosing the consultation day of the Doctor at the Clinic, the major reason in the choice of Monday was the theory that injuries acquired on the Saturday or Sunday activities would be reported early to the Clinic after 24-48 hours of rest, ice, compression and elevation. The Medical Officer, a busy General Practitioner, would not have expressed a preference for Monday by choice on the grounds of his general practice workload during that day.

As Table 9 shows, less than 7% of the injuries presented within this 48 hour period. This was a major disappointment. Only 32% of all injuries presented within two weeks of their occurrence. At the other end of the scale, over 14% of the injuries were six months old. This type of pattern of presentation certainly does not make the job of successful treatment any easier.

Cost did not seem to be a deterrent feature of the logic behind this delay in presentation. Rather it was a function of philosophy involving either a failed trial of rest or of a disappointment in treatment sought elsewhere. This was followed by increasing desperation on seeing no evidence of any improvement, causing a decision to utilise the Clinic's facilities or learning of its existence by word of mouth from other sportsmen. None of the other studies previously mentioned have looked at this pattern at all so it is difficult to state if this is an isolated phenomenon.

The only hopeful aspect was that in recent years, 1986-87, the delays in attendance seemed to be getting less, perhaps as a response to continued education and the fact that people may have been attending with a second injury having been told at their first attendance about the importance of presenting at the Clinic relatively early.

TABLE 9 TIME BETWEEN INJURY AND PRESENTATION

	NUMBER	%		
Not stated	31	2.1		
Less than 3 days	100	7.0	)	
			)	
3rd - 7th day	105	7.3	)	32.2%
			)	
7th - 14th day	245	17.9	)	
2nd - 4th week	308	21.6		
4th - 12th week	326	23.0		
3rd - 6th month	99	7.0		
6th - 12th month	95	6.6	)	
			)	
12 months or more	108	7.5	)	14.1%
	1417			

TABLE 9

TIME BETWEEN INJURY AND PRESENTATION

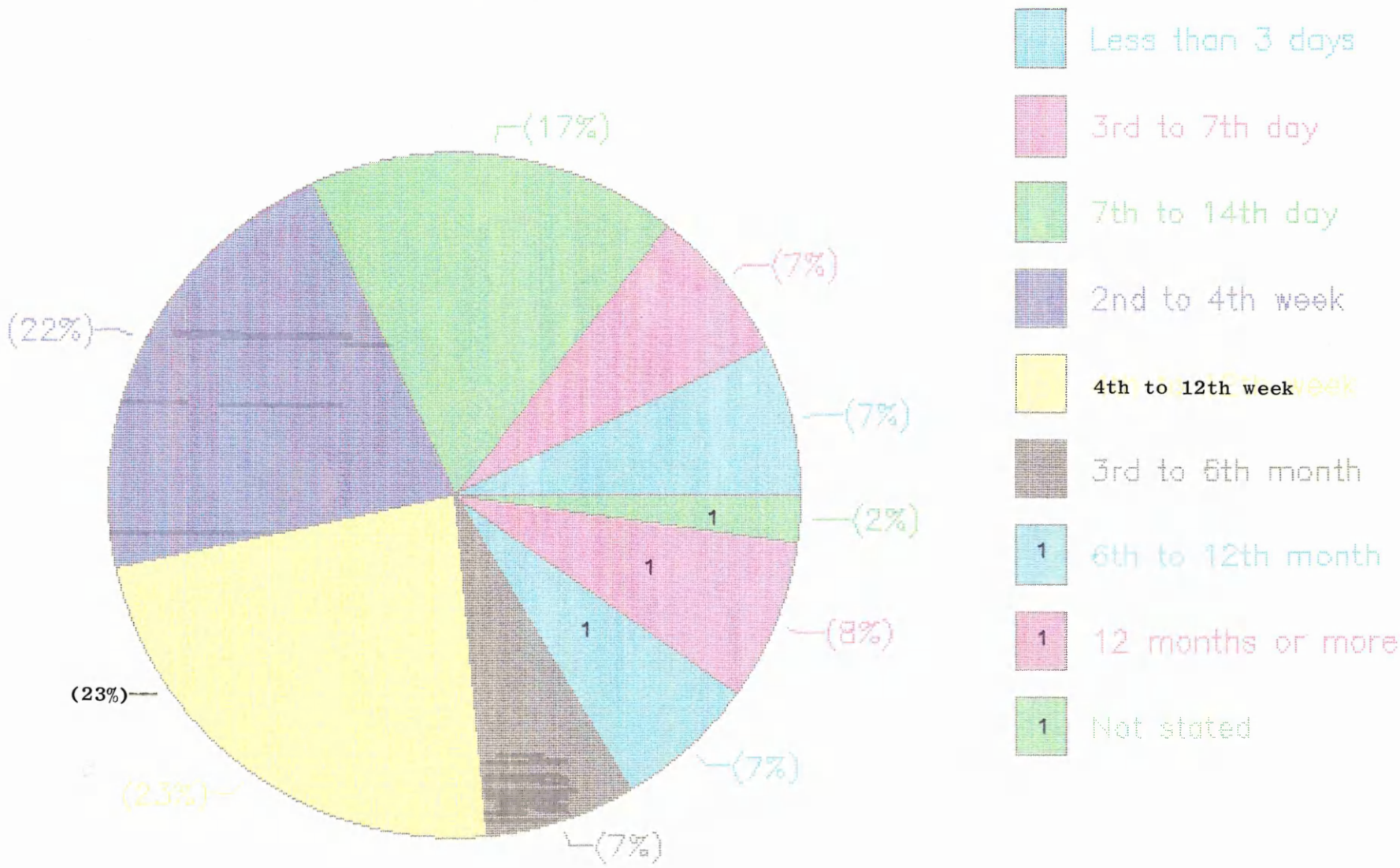


TABLE 10. SOURCES OF INJURY:

Trauma provided 60% of all the injuries presenting to the Clinic. Of all the trauma, two thirds of it occurred during a match, race or other performance. One sixth of the trauma occurred in training and the other sixth occurred at other sources such as workplace, home or even the street. 37% of all injuries resulted from overuse in the repetitive motion of many sports, particularly running.

As Table 10B shows, medical conditions represented a tiny but interesting amount of the work of the Clinic, and they represent a possible area of future expansion. They were mostly runners or athletes who had previous contact at the Clinic with an injury and who wished advice on physical ill-health which was affecting their performance. These referrals included advice on gastrointestinal upset, nausea and diarrhoea in distance runners; three people with apparent viral infections sought advice on running. Interestingly, at a later date, it was revealed that one of these was thyrotoxic.

One runner wished advice on abdominal pain "stitch". One sportswoman just wished "to pick the brains" of a Doctor who was interested in her sport, looking for all round advice on medical aspects. This potential area of expansion would ideally need laboratory support.

The overuse element has to be largely preventable and an integral part of the aims of the Clinic was to educate to prevent recurrence. Some success with runners appears to be demonstrated.

TABLE 10 SOURCE OF INJURY

	NUMBER	%
TRAUMA		
At Training	159	11.3
During Event	586	41.3
Other	131	9.2
	876	61.8
Medical Condition	10	0.7
OVERUSE INJURY	531	37.5

TABLE 10A
SOURCE OF INJURY

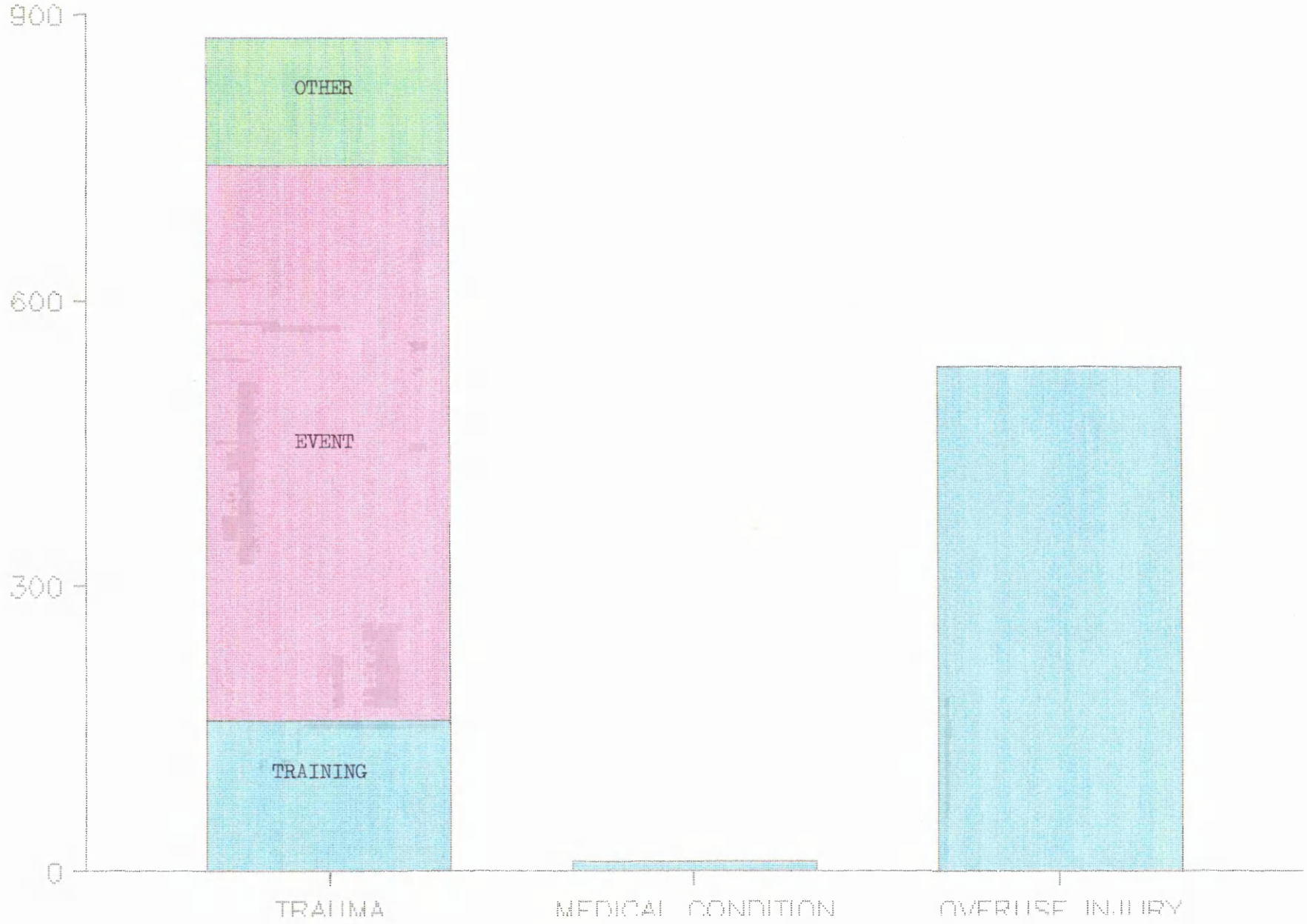


TABLE 10B MEDICAL CONDITIONS/SPORT

Gastrointestinal advice	1	Runner
Viral infection advice	3	Runner
Stitch advice	2	Runners
Dyspepsia advice	1	Athlete
Rheumatic type conditions	2	1 Runner/1 Handball
General advice	1	Athlete
	10	

TABLE 11 OSTEOCHONDRITIC CONDITIONS IN SPORT:

A special note was made of the osteochondritic conditions which presented at the Clinic. Lack of direct x-ray services made this difficult and the Clinic relied heavily on General Practitioner goodwill. Osgood Schlatter's condition (traction injury of tibial epiphysis) is relatively easily diagnosed clinically. Severs condition (apophysitis of os calcis affecting the epiphysis of the heel) is not. Severs condition would be better being defined as being "Severs-like in nature". Seventeen children presented with Osgood Schlatter's, five of whom were footballers, seven from athletics/cross country running. There were also three swimmers and two badminton players. Treatment was by ice and a prescription of relative rest i.e. no exercises that involved bending of the knee. This category was one of the few occasions in which parental pressure to perform and compete was observed. Protection of the child became quite important. There were five with Severs-like condition, four footballers and one athlete. Sorbothane insoles (a commercial shock absorbing polymer insole) inside the shoes was useful for this condition.

As the Clinic progressed it became apparent that the two conditions were a frequent source of presentation and thus the next two Tables are related to their occurrence in various sports.

TABLE 11 OSTEOCHONDRITIC CONDITIONS/SPORT

OSGOOD SCHLATTERS CONDITION	
Football	5
Athletics and Running	7
Swimming	3
Badminton	2
	17

SEVERS CONDITION	
Football	4
Athletics	1
	5

TABLE 12. PATELLO FEMORAL DYSFUNCTION (CHONDROMALACIA PATELLAE ANTERIOR KNEE PAIN SYNDROME):

Nomenclature proved to be quite a problem with this condition. During the years of the Clinic it became apparent in the Textbooks and Journals that the terminology Chondromalacia patellae is not reflected in arthroscopic evidence in all of these cases. The alternative of Anterior Knee Pain Syndrome is less than attractive as if this was suggested to the patient, could easily invite the reply that the patient knew they had a pain in the front of their knee before attending the Clinic. The phrase, Patello Femoral Dysfunction, while slightly clumsy, has the advantage of conveying the concept that the patella and its movement is very relevant to this condition. Use of this phrase to describe the condition has allowed the precipitating factors to be fully discussed with the patient. 118 patients presented with this syndrome, 35 in the right knee, 41 in the left and 42 with symptoms in both knees.

To make this diagnosis the patient had to complain of pain during exercise or after exercise. The pain was often vague and difficult to locate.

The examination has two parts - of the knee itself and then a more full biomechanical assessment is made. On examining the knee the apprehension test on moving the patella - Clark's sign, involves compression above the patella with the flat of the hand, followed by active contraction of the quadriceps, is used. If it is painful, it is positive. King in the textbook "Sports Injuries and their Treatment" (24) finds this a disappointing test, this was not the experience at Cumbernauld. Perhaps this reflects the possibilities that he sees a different population of patients from that attending a Sports Injury Clinic. As a Consultant Orthopaedic Surgeon, he /

TABLE 12 PATELLO FEMORAL DYSFUNCTION (Chondromalacia Patellae)

SITE

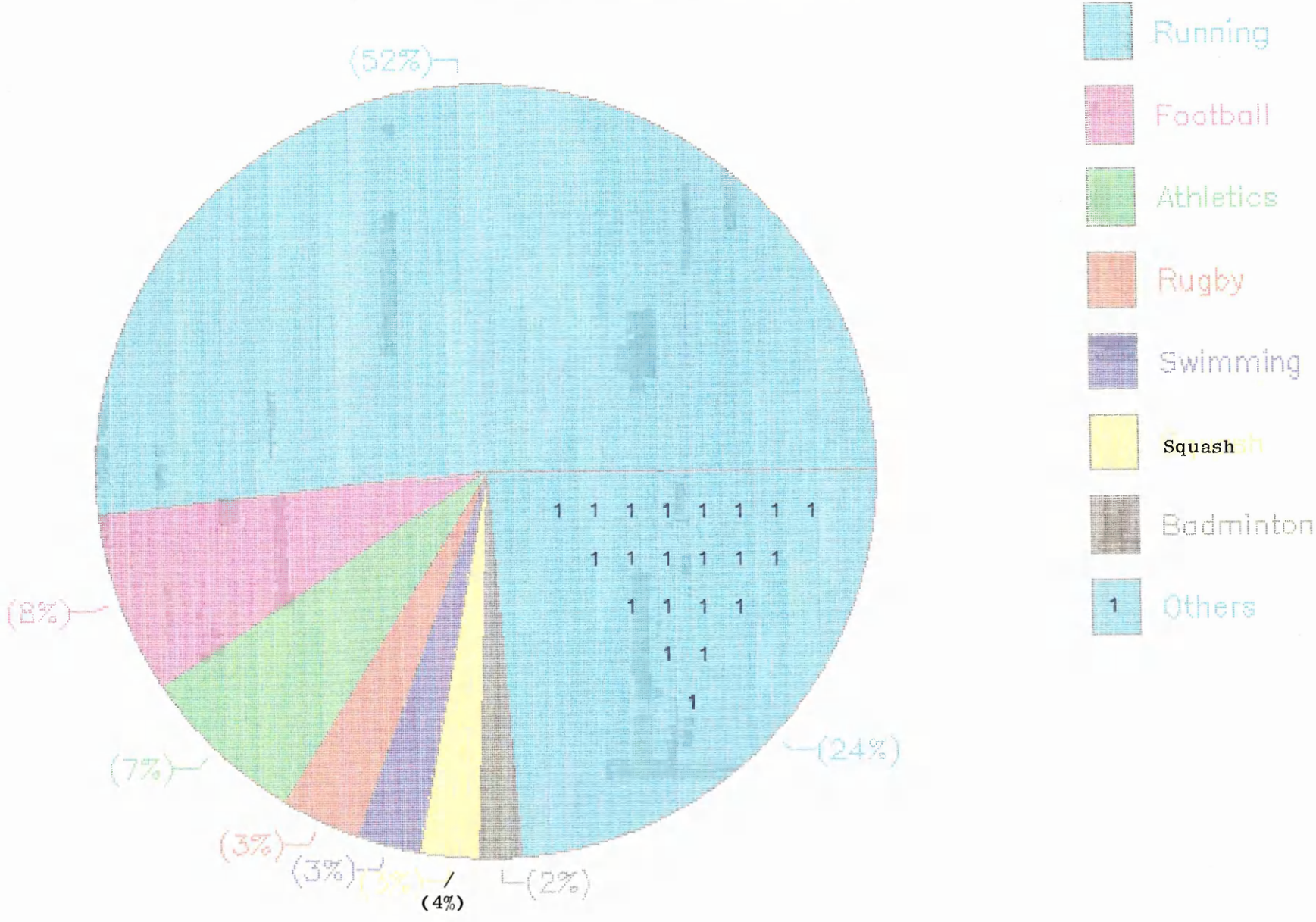
Right Knee	35	
Left Knee	41	
Both Knees	42	
	118	(8% of all injuries)

SPORT

Running	61
Football	9
Athletics	8
Rugby	4
Swimming	3
Squash	3
Badminton	2
Others	28
	118

TABLE 12 – PATELLO FEMORAL DYSFUNCTION

(Chondromalacia Patellae)



/he may well be seeing the patients such Clinics have failed to cure.

Having confirmed the diagnosis, the rest of the examination is to attempt to determine the cause or causes. The answer is usually in the abnormal tracking of the patella. While the knee flexes, the patella fails to glide within the grooves of the femoral condyle, irritation is set up by friction with direct contact usually on the lateral condyle.

FIG 1A
NORMAL PATELLA

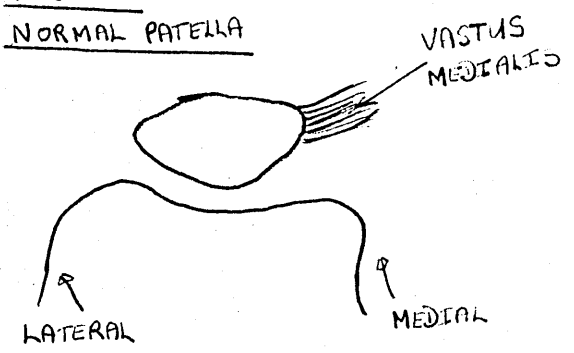
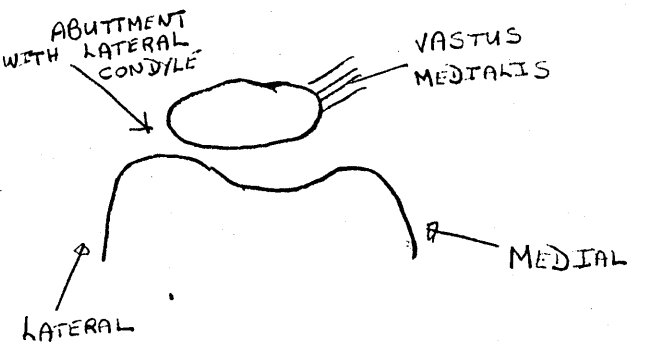
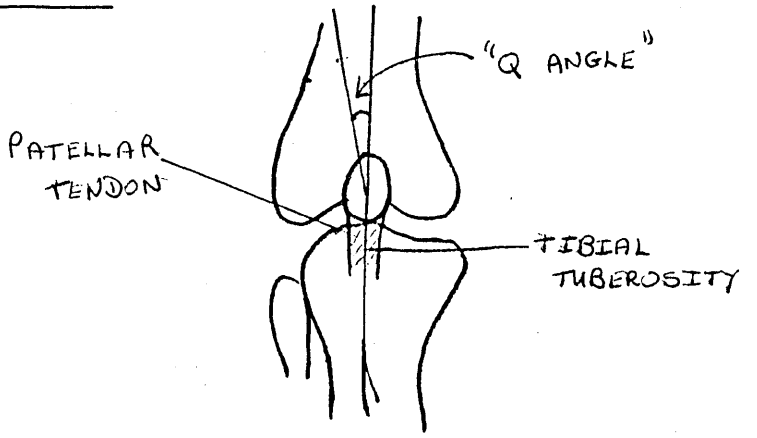


FIG 1B ABNORMAL PATELLA
WITH POOR VASTUS MEDIALIS



Maintenance of adequate tracking if a function of the height of the femoral condyles and a crucial muscular balance between the vastus medialis and the vastus lateralis muscle. (See Fig 1.) The ligamentous support of the patella retinaculum and ileo tibial band are other important factors. This can be partially quantified in measurement of Q angle, i.e. lines drawn from the anterior superior iliac spine and from the tibial tubercle through the mid point of the patella. A Q angle greater than 20^{o} is considered to be abnormal and significant. (See Fig 2.)

FIG 2 Q ANGLE



The role of the weakness of the vastus medialis is crucial in this condition and its strengthening and re-education by the means of straight leg static quads contraction frequently and gratifyingly produced a cure. There was a disappointing level of awareness of this condition amongst the opinions many patients sought before arriving at the Clinic.

Further comment on the patello femoral dysfunction syndrome will be made during the discussion of Running injuries q.v. As Table 12 shows clearly, running was the major sport associated with patello femoral dysfunction which occurred in 61 runners. The preponderance of runners presenting with patello femoral dysfunction is demonstrated in that runners represented 27% of all attendances, yet 51% of all those attending with patello femoral dysfunction. In contrast footballers had 22% of all injuries but only 8% of those presenting with patello femoral dysfunction. The condition also occurred in other sports but there may well be an element of repetition running in some of their training. Of the 3 swimmers who presented with this condition, 2 were breaststrokers which was thought to be relevant in view of the kicking action from the fully flexed position. The third had added 5 mile runs to his training scheme while the baths were closed.

It was surprising to see King is his book (24) suggest it is a peculiarly adolescent female condition. In this Clinic's experience, runners of all ages and sex frequently present with this condition. In "Sport and Medicine" by Sperryn (25) a much more realistic account of the role of sport in causing this condition is given. Probably this again reflects the difference in population seen by the Practitioners with Mr. King being an Orthopaedic Surgeon and Dr. Sperryn a Physician with a well known interest in running. The Cumbernauld experience reflects very closely that of Dr. Sperryn. A particularly fascinating presentation was that of a very experienced dance teacher who, because of many of the movements involved in the dance routine had exceptionally /

/exceptionally well developed other quadriceps muscles but with virtually no vastus medialis at all. This muscle was quite simply never used in her regular routine.

Other biomechanical problems and anatomical factors are relevant. The many different alignments of the patella encountered have been a revelation to the Medical Officer - squinting patellae, small patellae, large patellae, patellae situated high in the knee, all are variants which have been seen.

Until many Practitioners look at the vastus medialis and the patella and its actions, many sportsmen will suffer unnecessarily from this condition.

TABLE 13. INVERSION INJURY OF THE ANKLE:

This was the most common injury seen at the Clinic. There were 142 in total or 10% of the attendances at the Clinic. This excludes eversion or flexion injuries and the chronic ankle strain which seems to be related to long distance running. Sadly, a large number of these injuries were chronic. Most experts agree that the inversion injury is the commonest single sporting injury.

I.Adams of Leeds (26) writing in "Sports Injuries and Sports Fitness" quotes that 12% of all sporting injuries affect the ankle joint. Of these ankle injuries, 85% are sprains and 80% of these sprains relate to the lateral ligament. Several American authors contributing to the "Clinics in Sports Medicine" series (27) concur stating that 90% involved the lateral ligament. Williams and Sperryn (28) in the old standard textbook "Sports Medicine" state that acute sprains of the ankle joint were the commonest single type of injury. Crean (29) states that 14% of all sports injuries were of the ankle and that the method of injury was inversion, plantar flexion and internal rotation. Sadly, Adams (26) reported that one third of the general public with this injury still had significant symptoms one year later.

These figures were reflected at Cumbernauld. 16% of all the injuries at the Clinic involved the ankle and Achilles tendon. Excluding Achilles tendon injuries, flexion and eversion injuries, there were 142 inversion injuries, i.e. 10%.

Table 13 shows that football, with 56, produced most injuries but many runners, 24 in number, also had the complaint and its occurrence is noted in most sports and this was seen in the category "Other" with 28 in all.

An illustration of the preponderance of the inversion injury of the ankle among footballers is shown by the fact that while footballers represented 22% of all attendances at the Clinic, they produced 39% of those presenting with ankle injuries. In contrast, the runners who /

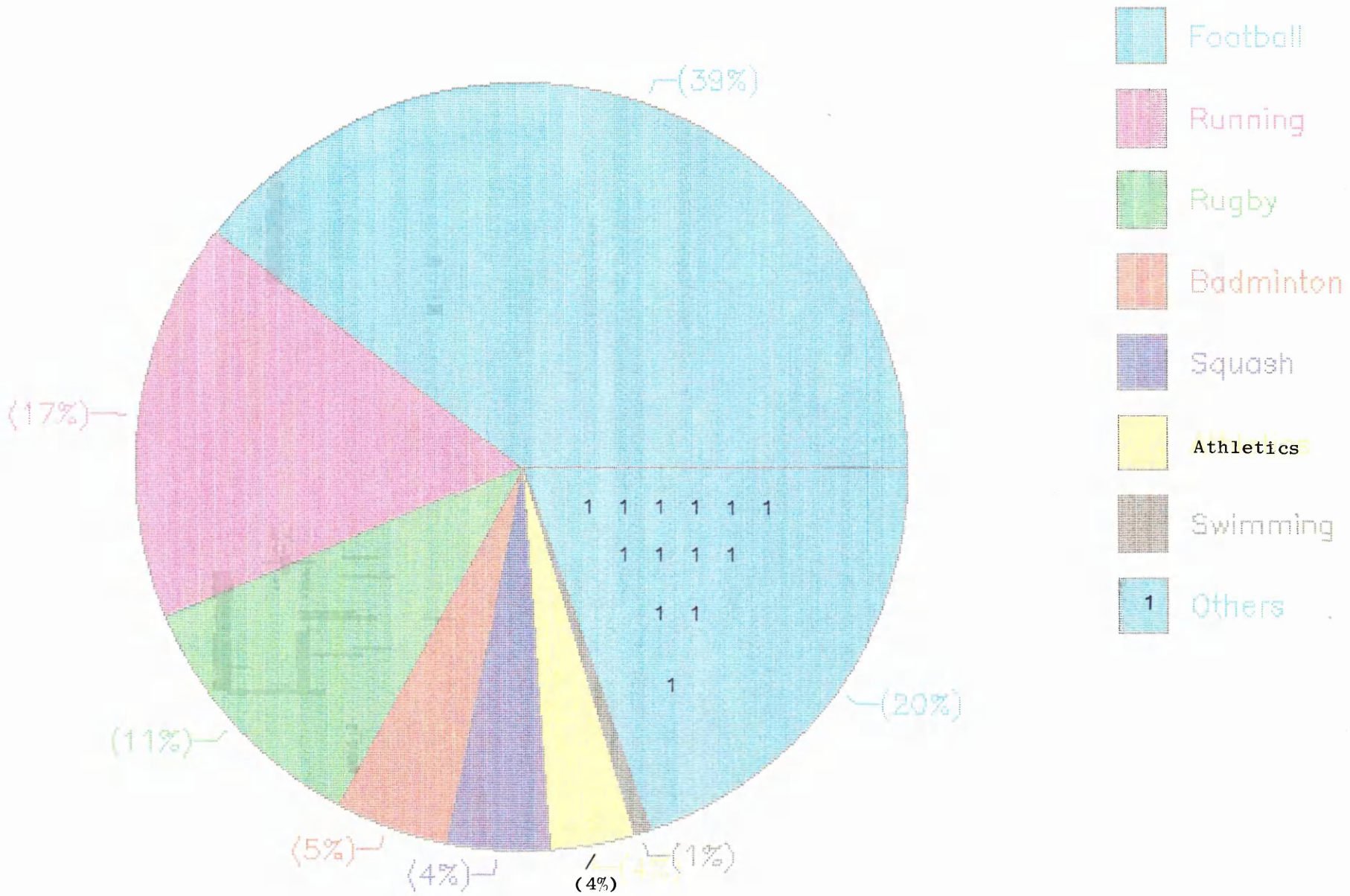
TABLE 13 INVERSION INJURIES OF THE ANKLE

SITE	
Right Ankle	69
Left Ankle	68
Both Ankles	5
	142 (10% of all injuries)

SPORT	
Football	56
Running	24
Rugby	15
Badminton	7
Squash	6
Athletics	5
Swimming	1
Others	28
	142

TABLE 13

INVERSION INJURIES TO THE ANKLE



/who represented 27% of all attendances, had only 17% attending with inversion injury of the ankle. Rugby with 10% of ankle injuries and 9% of all injuries and Badminton with 5% of all injuries and 5% of ankle injuries seem to reflect a more equitable pattern. Thus, the mechanism involved in football predisposed to the inversion injury, in a way that simple running does not.

While some of these injuries occurred outside a sporting context, e.g. a good middle distance athlete severely damaged an ankle while running for a bus and a footballer sustained a significant ankle injury during gardening, the main source of ankle injury involved movements of turning, stopping, side-stepping and tackling - characteristic of football. Poor pitches and rough terrain with potholes contributed to the causes of this injury. The mechanism usually involves loss of stability laterally - when inversion was initiated and the peroneal group of muscles were unable to hold the foot in the stable position. The strength of the lateral ligament was thus overcome, resulting in injury. Tenderness on or below the lateral malleolus was the usual feature. There were also some cases that displayed medial symptoms, perhaps a function of capsular nipping.

Damaged in order of frequency were anterior talo fibular ligament, the calcaneal fibular ligament and the posterior talo fibular ligament. The comment of Sperryn and Williams (28) that the degree of bruising was not a good indication of the severity of the injury was confirmed at Cumbernauld. However, there were only two possible Grade 3 (unstable) injuries seen and these were old at the time of presentation. It is interesting that these also seemed to improve with the exercise regime prescribed at the Tryst.

While there has been much argument in the past, the American authors in the Sports Clinic Series and most British authors, favour early rehabilitation. Vegsa (27) states that the commonest cause of recurring or chronic injuries was decreased ankle dorsi-flexion. Brook et al (30) /

/(30) in a Casualty setting, showed that mobilisation with physiotherapy, although not practical for all patients, was the most satisfactory course of treatment offering rapid return to functional activity. Cetti in Denmark (31) showed that early mobilisation did have a positive influence on the risk of subjective functional instability and gave a quick return to the normal gait and sport.

The usual method of treatment at the Tryst followed that recommended by Grisogono (32) in "Sports Injuries - A Self Help Guide". A detailed account of this is given in the section on Injuries to Footballers as this sport produced the most inversion injuries.

While appreciating that there are immense pressures on Casualty Officer and General Practitioner's time, the philosophy of "no bone injury, double tubigrip and discharge", is not adequate enough for the general public far less for the sportsman. While the Grisogono based exercise sheet is perhaps too complicated for general public release, a small sheet given out in Casualty or in the surgery, would give the general public and sportsman alike, an opportunity for rehabilitation. An example of such a sheet given out in General Practice is shown in Appendix 2. The Medical Officer believes that such a sheet would offer both the general public and sportsman alike a chance to have a simple but better rehabilitation of their inversion injury. (A clinical trial to attempt to prove this is suggestion in the Conclusion section).

ANALYSIS OF THE MAJOR SPORTS.

To avoid repetition some injuries are dealt with in the sports section in which they dominate, e.g. Hamstring Strain in the athlete, Knee and Ankle Ligament injuries in the footballer.

TABLE 14A(i) and 14A(ii) INJURIES OCCURRING TO RUNNERS:

Running was the sport whose participants presented the most at the Tryst, almost 400 in total. Runners were defined as those who trained or raced over distances more than 5 kilometres.

This was a major surprise to the organisers of the Clinic which was planned in 1980, but was an accurate reflection of that major sociological phenomenon known as the "Running Boom". There has been a long Scottish historical tradition of Harriers; Hare and Hounds and Cross Country Running, but it was essentially the interest of a tiny minority and races rarely featured fields reaching into triple figures. Both the athletics world and the medical profession were ill-prepared for the "Running Boom".

The origins of this expansion were in the United States. There were many reasons for this. Chief amongst them must be the publication in 1968 of "Aerobics" by Kenneth Cooper. Certainly Joe Henderson, Editor of the influential American running magazine "Runners World" gives most of the credit to Cooper (33). Cooper, a fitness consultant for the United States Air Force suggested that sustained exercise would benefit cardiovascular fitness, circulation and respiration. He argued for not less than fifteen minutes of exercise and suggested that many traditional sports such as soccer, golf, tennis had too many interruptions to be of value. His preference was for running, brisk walking, swimming and cycling. He published appropriate charts and advice on how to use the various sports to obtain aerobic fitness.

Endorsed by the American Heart Association and the President's Council of Physical Fitness, the sport of "jogging" had arrived. Other factors contributed. A Marathon victory for the United States runner, Frank Shorter, at the Munich Olympics in 1972, in what was a poor Olympiad for the United States athletic team, helped. Possibly the increase in Marathons was already noted before Shorter ran in 1972, i.e. in 1969 there were 44 Marathons in the United States, but by 1974 there were 130. However, Shorter's personality and image undoubtedly helped the expansion.

Another factor that increased the popularity of running was the large City Marathons. In 1974 the New York City Marathon was run in a five lap circuit round Central Park in 275 runners. In 1976, to celebrate the Bicentennial of the founding of the United States it was switched to a point to point race through five New York Boroughs. On that Sunday morning, 2,000 people ran. By 1981 there were 16,000 starters, 30,000 others having been rejected and it was estimated that two million people watched this race (34).

The book was fuelled by further books by Dr. Cooper, by Dr. George Sheehan and most spectacularly, by James Fixx. Fixx, who claimed he was sixteen stones, a heavy forty cigarettes a day smoker and had a very sedentary lifestyle until he discovered running, wrote "The Complete Book of Running" which was in the United States bookshops Best Selling Charts for eighteen months. Fixx's death in 1984 influenced many people to stop running or to use his death as an excuse for not participating in exercise.

In the United Kingdom the growth of "jogging" partially imported by Lydiard of New Zealand was encouraged by the "Sunday Times". Its Athletics correspondent, Cliff Temple, published "Jogging for Fitness and Pleasure" in 1977 and this was followed in 1979 by the Sunday Times Fun Run in which 15,000 joggers ran two and a half miles of Hyde Park.

A rival quality Sunday newspaper, "The Observer", was next to add fuel to the flames in the form of its correspondent, Chris Brasher. Brasher, inspired by a visit to the New York Marathon, speculated whether London could do the same. Eventually he had to organise this himself and in October 1980 began to plan the first London Marathon for the following year. On 29th March 1981, 7,055 started off from Greenwich to make their way to Westminster Bridge. 6,418 finished the race. In 1982 there were 90,000 applicants for 14,000 places in the London Marathon and even six years on, there are still 52,000 applicants for 29,000 places available in 1988.

In Scotland, after much in-fighting, Glasgow won the right to host the first Scottish People's Marathon. In October 1982, 5,478 started the race. Although a success in 1983 and 1984 with 9,300 and 10,120 runners, this race became reduced in popularity in 1986 with 8,200 starters and in 1987, 5,336. This race did not take place as a full Marathon in 1988. The reasons or suggestions offered for the relative decline (relative because if anyone had forecast in 1977 that in ten years time 5,000 people would run 26 miles round the streets of Glasgow, they would have been regarded as being mad) of Glasgow's Marathon are many. They include a tough route, the failure to offer large prize money, the time of year in which the race takes place and perhaps most important of all, the lack of decent television coverage. Perhaps the last is the most important of all these reasons.

It should however be borne in mind that the continued success of mass Marathons, such as London and New York, are based on a much larger population than Scotland's five million. There is a limit to the number of people who can or choose to devote the required amount of time to prepare for a Marathon. Fortunately for those who believe /

/believe it is important to have a healthy road racing scene, there is evidence of many runners turning to shorter races. There is a growth in half Marathons, Ten Miles and 10 Kilometre races throughout the United Kingdom. "Running" magazine in January 1987 stated that the number of races it publicised had increased by 30% over the same time last year.

More locally, Cumbernauld has hosted a half Marathon in 1985, 1986 and 1987 with respective starters of 300, 611 and 590. The small town of Kilsyth has had a 10 kilometre race with well over 100 starters in 1985 and 1986. In 1987 the race was cancelled because of organisational difficulties rather than a lack of runner demand.

This interest in running, especially in a Marathon, with many first time runners involved, is reflected in the attendance of runners at the Tryst. The numbers shown in Table 7A mirror the rise and decline of the Glasgow Marathon. A small Table is shown below to reflect this.

	1982-83	1983-84	1984-85	1985-86	1986-87
No. of Starters in Marathon	5478	9314	10126	8210	5336
Injured Runners attending Tryst	79	110	86	71	40

An American estimate (35) suggested that 60% of runners will sustain an injury at some time which prevents them running. Glover and Weisenfield (36) estimated that a third of U.S. runners sought some sort of medical attention each year and in high mileage runners completing 50 miles per week, 75% of them will get an injury at least once a year. Thus, the Tryst experience was not unusual.

TABLE 14A(i) INJURIES TO RUNNERS

PAT. FEM. DYSFUNCTION	61
ILEO TIBIAL BAND SYNDROME	44
ACUTE/CHRONIC ANKLE PROBLEMS	39
GLUTEAL/TRONCHANTERIC/HAMSTRINGS	25
S.I. STRAIN/MUSCULAR STRAIN/SCIATICA	24
SHIN SPLINTS/POST. TIB. COMP. SYNDROME	23
ACHILLES TENDONITIS/PERITENDONITIS	22
INFRA PATELLAR TENDONITIS	20
GASTROC. STRAIN/TEAR	19
MED. LAT. LIG. KNEE	15
ANTERIOR (TIBIAL) COMPARTMENT SYNDROME	14
SPRING LIG. STRAIN/PLANTAR/FASCIITIS	11
POPLITEAL TEAR/STRAIN AND POPLITEAL CYST	9
ADDUCTOR STRAIN	9
LAT. (PERONEAL) COMP. SYNDROME	8
ARCH PROBLEMS	8
METATARSAL PROBLEMS	4
OSGOOD SCHLATTERS	3
OTHERS	34
	392

Runners attended the Tryst from many long established Harriers, such as Cambuslang Harriers, Springburn Harriers and Falkirk Victoria Harriers. Many came from new Clubs such as Cumbernauld Amateur Athletic Club and Kirkintilloch Olympians, but the majority were unattached to any Athletic Club.

The major difficulty for any Medical Attendant to runners in the early days was the paucity of information. There has always been medical information available on other sports but many of the patterns of injury were unique to running, e.g. the Ileo Tibial band syndrome occurs under no other circumstances than with the distance runner. The standard British sports medicine text, "Sports Medicine" by Sperryn and Williams does not have the Ileo Tibial band in its index. It also states that plantar fasciitis is uncommon among athletes and is sometimes connected to rheumatoid arthritis. Although there are now many excellent textbooks relevant to running such as Sperryn's "Sport and Medicine", Grisogono's "Sports Injuries; A Self Help Guide", Reid's "Sports Injuries" and chapters in general advice books such as "A.A.A. Runners Guide", in 1980 information was scarce. Knowledge was obtained either from trans Atlantic books such as George Sheehan's "Medical Advice for Runners" and Ciba Geigy's "Clinical Symposia", or from running magazines - Grisogono's Running Body series in "Running" magazine was particularly useful.

PATELLO FEMORAL DYSFUNCTION:

The commonest running injury seen at the Tryst Clinic was that of patello femoral dysfunction (chondromalacia patellae) which is so common that it is sometimes known as "Runner's Knee". 61 runners, 15% of the total presented with this complaint. Sheehan (37) found in a study of 1,000 United States runners that the knee was /

/was the commonest site of injury (23%). This had included all aspects of the knee and if one examines the Tryst figures and includes infra patellar problems, Osgood Schlatters and some such as Hoffa syndrome which were included in the "Other" category, then the Tryst percentage would be very similar. Brody (35) reported that 30% of all attendances at his clinic in Washington D.C. were related to knee injuries.

Devereaux and Lachmann (38) in a University based sports Clinic found that patello femoral arthralgia occurred in 5.4% of the total injuries. This can be compared with Table 12 in the Tryst series in which the Cumbernauld figure was 8%. The Cambridge study took place between the years 1978-82 and it would be interesting to speculate if the number of runners at that time were less than those in the years 1982-87. Thus, patello femoral dysfunction (or any of its synonyms) is a common cause of disability presenting at any Sports Clinic, especially amongst the runners.

Most of the Tryst runners with patello femoral dysfunction were novices although three of those who presented with this condition had finished in the Top 100 of the Glasgow Marathon 1982. The experienced runner seems to suffer from patello femoral dysfunction when he is returning to running after an absence due to viral infection or after another injury. Perhaps this patello femoral dysfunction in the experienced runner is caused by reduction in the strength of the quadriceps caused by the illness or too rapid an increase in mileage after the injury or illness. The over vigorous return could cause a previously compensated minor biomechanical abnormality to provoke patello femoral dysfunction. Mostly though it occurred in the novice runner, usually in the first year of running and when he is beginning to extend the mileage.

Presentation is with pain, often an ill defined pain around /

/around or behind the patella. The pain usually occurs at exercise, some times easing during the latter stages of a run, but returning after it. As the pain is frequently "run through" the patient reaches an "end state" where running is impossible and the pain may intrude on normal daily life with pain on going up and particularly going down stairs, pain on sitting particularly in the car and in a tiny minority, a feeling that the knee may be going to give way.

The weakness of the vastus medialis cannot be overstressed in its role. At least 23 runners in the Tryst series were observed to display this factor as shown in Table 14A part (ii) and this represents only the minimum numbers of runners in which the weakness was indisputable and related to the condition. This table also shows there are other biomechanical abnormalities such as genu varum, tibia vara, femoral neck anteversion, tibial torsion and perhaps importantly, abnormalities of the feet all associated with this condition. Brody (35) uses the phrase "malicious malalignment syndrome" to describe a runner who will almost inevitably have patella problems. This syndrome consists of a broad pelvis, femoral neck anteversion, excess Q angle, hyper mobile patella, external tibial torsion and pronated flat feet. Seven of these unfortunate individuals presented at the Tryst. (Table 14A part (ii).)

Sheehan, the American "guru" (37) states that to treat the "Runners Knee" you must treat the foot. This aphorism is most certainly correct. As Table 14A part (ii) shows the most common biomechanical abnormality associated with this injury is the pronating foot (flat foot). All running feet pronate to some extent with each step;- pronation occurs after heel strike in the support phase when the foot unlocks for surface adaptation and shock absorption. During the act of pronation, the tibia rotates internally on the talus proportionate /

TABLE 14A (ii) BIOMECHANICAL ABNORMALITIES/RUNNING INJURIES

	BIOMECHANICAL ABNORMALITIES					
RUNNING INJURY	QUADRICEPS WASTING	GENU VARUM	TIBIA VARA	PRONATING FOOT	MORTON'S TOE	MALICIOUS MALALIGNMENT
PATELLO FEMORAL DYSFUNCTION	23	10	14	30	16	7
SHIN SPLINTS		1	10	22	6	1
ILEO TIBIAL BAND		10	8	19	2	
ACHILLES TENDONITIS		1	1	7	2	
OTHERS		5	4	13	1	

/proportionate to the amount of pronation. Thus, if pronation is excessive, the ankle sags, the tibia internally rotates to compensate and external rotation occurs at the knee straining the supporting structures at the knee. Excess pronation is associated with tibia vara, tight Achilles tendon, tight calf muscles and varus deformity in the foot itself. While true observation of pronation can only be analysed as part of the running action, in many cases a reasonable conclusion can be drawn from the position of the walking foot or the resting foot which shows a flat foot type of deformity. Although 30 runners were seen with this deformity at the Tryst, this represented only the minimum in which evidence was indisputable. Sheehan (37) believes that Morton's Toe, when the second toe is larger than the first, is an important factor and certainly 16 of the Tryst runners displayed this anatomical feature.

Other important causative factors noticed seemed to be the environment, e.g. shoes and surfaces. Many novice runners do too much, too early, on hills and poorly shod. While geography is difficult to alter, even hills can be avoided by careful route planning. There is now good guidance available, with many books and articles explaining how much? how soon? The camber of the road can also be a factor as the slope will help to flatten the arch and add to excess pronation and thus to patello femoral dysfunction. Shoes can help to prevent this problem by compensating for some of the deficiencies and by allowing excellent shock absorption. Sadly, many novice runners begin in plimsolls, other sports trainers or cheap running shoes and these are usually inadequate because of a basic inherent biomechanical factor which seems to predispose to running injuries. The common philosophy is not to buy an expensive running shoe till the runner sees if he or she enjoys running. This is a false economy as the almost inevitable overuse injury /

/injury frequently will discourage running. This easily could have been avoided.

Having made the analysis, the treatment is approached in two ways. Firstly, relieve the inflammation and pain. An ice pack every night and when the runner begins to resume running an ice pack placed on the knee after the run seems to have a useful role. Anti-inflammatory medication prescribed by the General Practitioner has a useful contribution to make. Electrical physiotherapy seemed to be unhelpful with the possible exception of interferential. An elastic strapping which is designed to elevate the patella seems to have a useful role in the short term. Perhaps it acts in a proprioceptive re-education role rather than a simple mechanical role. This is evident as the strapping soon loses some of its support.

The second aspect of treatment is to prevent recurrence. Runners need education about progressing slowly, i.e. very gently increasing the mileage. Advice about the road camber and softer surfaces whenever possible, avoidance of hills in the early days of running and the use of appropriate footwear, are all very important factors. Building up of the vastus medialis muscle is essential. Static contraction and straight leg raising with the toe curled were the standard exercises used at the Tryst. The duration of straight leg with toe curl is increased and then there is the later addition of weight at the ankle. A similar exercise can be made with a rolled-up towel under a slightly flexed knee with the foot one to two inches from the ground. Contraction is made to push the foot to the ground but resisted, thus there is no movement. The straight leg toe curl is much easier to explain.

The squat as an exercise is buried deep in the "psyche" of many athletes but should be discouraged since this exercise leads to extremely high interface pressure between the patella and the femur.

Stretching of the quadriceps and calf muscles is also very helpful as tightness of both of these can be precipitating factors. For many runners these are all the measures that are required and after a short period of relative rest, i.e. no running, resumption can be permitted. For those with recurring problems there is a place for podiatrist assessment and possible use of an orthosis if the foot is the problem (see later discussion).

In summary, in patello femoral dysfunction, the important preventative factors include avoidance of elementary errors, strengthening of vastus medialis (particularly in the female of the species), general stretching for all runners and appropriate footwear.

ILEO TIBIAL BAND:

It was surprising to find that the Ileo Tibial Band syndrome was the second most common running injury seen at the Tryst. The Ileo Tibial band is part of the fascia lata passing down the lateral aspect of the thigh to insert into the lateral tibial condyle. The repetitive function of long distance running causes the band to rub over the lateral femoral epicondyle as the knee flexes and extends. The rub leads to inflammation and hence the pain as the runner continues. Often the runner notices that the pain occurs at a certain time or certain distance but if he continues to run through it the pain becomes increasingly easier to induce occurring at an earlier mileage or earlier in time in the run.

Brody states that it occurred in less than 10% of his runners and Sheehan (37) stated that injuries of the thigh were present in only 7.5% of running injuries. Excess diagnosis is unlikely to be a factor in the Tryst series as other than popliteal tendonitis (which is essentially treated in the same way) there is no other likely diagnosis which can be confused with this condition.

Interestingly while some patients who had sought advice elsewhere had been correctly diagnosed in many conditions and were just seeking treatment at the Tryst, not one runner presented at the Tryst as having had a diagnosis of this syndrome made previously. Nor does this condition seem to occur in any other sport apart from distance running.

Very often the runner finds that he can still participate in other sports, e.g. hockey, football, rugby, with no problems at all. One sportsman with this complaint was convinced that refereeing his first rugby match of the season was a major factor in his cure. Speculation that perhaps the function of sprinting involving a greater degree of flexion and extension than distance running might have caused the break-up of some inflammatory adhesions at the site. The Ileo Tibial band syndrome seems to occur in relatively new runners increasing their mileage, perhaps preparing for a Marathon. It certainly seems to occur later in the mileage build up than patella femoral dysfunction as demonstated in the tables on mileage.

Diagnosis is made by finding a tender spot on the band at the femoral condyle with the knee in 20^{o} - 30^{o} of flexion. Occasionally the inflammation and tender spot is at the actual insertion of the band on the tibial condyle but for the vast majority, it is femoral.

As shown in Table 14A(ii), the associated findings seem to be genu varum, tibia vara, pronating foot and Morton's toe which appear to alter the biomechanics. A very important factor in this condition is the lateral posterior aspect of the sole at the heel of the running shoe. Often the accumulative mileage required in building up to the Marathon destroyed the outer sole of the shoe and very frequently repair of the sole by itself could be curative. This finding at the Tryst confirms Brody's (35) suggestion.

Treatment was by ice cube massage, ultrasound physiotherapy was found to be very useful in this condition. Stretching of the thigh muscle, repair of the shoe, avoidance of hills and camber of the road were all important factors in treatment. Stretching involving toe touching with crossed legs (one runner claimed to have run the London Marathon by stretching this way every five or so miles in the latter stages). A better stretch for use in the house is sitting with the non-injured leg straight with the injured knee bent and the foot of the injured leg on the opposite side of the non-injured leg. Then using the hand and the non-injured leg gently, the lateral thigh may be stretched. Steroid injection is helpful for the resistant or desperate (week before the Marathon) runner. Podiatry can be helpful in this condition. Only one patient has failed to respond to all these measures and he has a very unusual massive thick ileo tibial band with other biomechanical abnormalities and he was referred to his General Practitioner for Orthopaedic opinion.

There are three possible reasons why Scots might suffer more from this condition than their American or English counterparts. Perhaps the Scot has more inherent biomechanical problems such as tibia vara. Secondly, there are more hills in Scotland. One patient, an ex patriot Scot exiled to Ohio, found that he developed the Ileo Tibial band while running in Scotland. His biomechanics, his shoes and mileage were all the same as when he was in the States, but the difference seemed to be hills even in the Central Lowlands of Scotland. A third, perhaps irreverent suggestion may be that the Scots are more parsimonious when replacing their damaged running shoes. Fortunately, this problem can usually be satisfactorily treated.

THE ANKLE:

The ankle has been discussed elsewhere and the injuries in the runner almost entirely reflect the previously described pattern. Acute inversion injuries while running or engaging in other sports or even in every day life, are treated with the full ankle rehabilitation regime. Some runners found that previous ankle injuries, perhaps inadequately rehabilitated, were re-activated by running.

Two injuries seem to be unique to running. One was a chronic strain of ankle ligaments, particularly the lateral, not due to any injury, but a function of abnormal ankle strain produced by abnormal foot action such as hyper-pronation. Attention to shoes and makes of shoes is particularly useful as were exercises used in treating acute inversion injuries. Podiatrist assessment may be required for this type of condition.

Lateral peroneal teno synovitis was recorded on one occasion in a hyperpronating runner and responded to new shoes and isometric exercising.

The inversion injury of the ankle causes disappointment for sportsmen and runners are no exception to this rule.

HIP AND THIGH:

While the injuries in the gluteal/trochanteric area bear some similarity to the hamstrings, they were included in this section only on the grounds of anatomical proximity.

Trochanteric bursitis presenting as pain and tenderness over the greater trochanter was a function of high mileage in the runner with biomechanical abnormalities such as a broad pelvis (particularly the female) and possible leg length discrepancy. Leg length discrepancy is difficult to quantify without x-ray evidence and while in the early days of the Clinic frequent measurements were taken, this just seemed often to produce confusion. In the latter days of the Clinic a rough idea of functional leg length /

/length discrepancy could be made by asking the patient to sit on the couch with knee flexed and feet placed flat on the bed. Checking to ensure that the back and hips are level, direct observation of the relative heights of the knee seems to give a clue. However, if leg length was regarded as being a crucial part of the recommendation for any condition, then Podiatrist assessment was recommended.

Back problems and tight hamstring also contributed to the injury as does running on the camber of the road. Gluteal pain seems to be very similar in type and causation. Treatment was by ice, ultrasound and stretching, particularly the exercises used to treat the Ileo Tibial band syndrome. One runner with a persistent trochanteric bursitis required steroid injection.

While the spectacular tear of the hamstring was the province of the sprinter, distance runners can produce hamstring problems also. It was observed that typical tears or strains occur in the distance runner who added intervals of sprinting in an attempt to add to his speed. It is possible that the hamstring, tight after years of repetitious distance running, is asked suddenly to extend and stretch with which it is not able to comply. A less spectacular hamstring pull is seen where there is an excess of hill running, particularly of a repetitive nature. While ice and ultrasound are helpful, the importance of flexibility and stretching are crucial in prevention and treatment (see Athletics injuries).

In dealing with hip and hamstring problems, attention must be paid to the back as sciatica can mimic a hamstring problem though possibly the two can even co-exist.

THE BACK:

The back in its various guises can cause problems for the runner. Major disc lesions are rare but chronic problems with sciatic radiation /

/radiation and problems purely confined to the back were not uncommon. 23 such patients presented at the Tryst. Sacro iliac problems seemed to be a function of abnormalities in the leg such as leg length discrepancy, genu varum and tibia vara and the pronating foot, but they can also be caused by poor running form or a major discrepancy in development of the muscles of the back contrasted with a relative under-development of the abdominal musculature. The very act of running tightens the hamstrings and the ileo psoas muscles but has less effect on the abdominal musculature. Tight hamstrings do contribute by making lordosis more marked. Speed work, downhill running and poor shock absorption in shoes also seems to have a contributory role.

Interferential and short wave diathermy have a role to play as does manipulation but an important part of treatment for back problems involves strengthening the abdominal muscles by bent knee sit-ups and stretching the hamstring and the calf.

"SHIN SPLINTS":

Bates (30) in an excellent review of the literature reports confusion throughout the medical world about usage of the phrase. He even reports that the American Medical Association is unable to give a satisfactory definition. Not surprisingly if the nomenclature is confused, the aetiology is equally obscure. Bates (30) while reviewing the literature suggests three possible mechanisms; one, overstress to the bone, two, compartment syndromes and three, biomechanical factors. He felt that the body of evidence supports the idea that increased compartment pressure may cause shin splint pain but not all shin splint pain is due to the compartment pressure. Most runners seem to have developed the problem via a mechanical cause leading to a musculature problem then tendonitis, periostitis and even in some cases, stress fracture.

Various lower leg syndromes presented at the Tryst; posterior tibial syndrome (22 runners), anterior compartment syndrome (14 runners), the lateral peroneal compartment syndrome (8 runners).

The anterior compartment syndrome is used to describe a syndrome of ischaemia of the muscle caused by increased tension in the fascial compartment - this did not present at the Tryst and the phrase is not used in this context.

Even the synonym "shin splints" which is often conferred on these types of problems is unsatisfactory - Brody (35) uses the phrase in connection with the posterior tibial muscle as affecting the inner aspect of the tibial shaft; whereas Sheehan (37) uses it to refer to the anterior compartment and the anterior aspect of the tibial shaft; Sperryn (25) uses it to describe both.

At the Tryst, two runners presented with such gross swelling of the compartment that it was felt at their initial consultation that for once this might be a genuine ischaemic condition. However, prompt resolution proved this diagnosis to be unlikely. Fortunately, the majority of the cases seen at the Tryst did not need bone scan, pressure studies or ultrasound examination all of which Bates (39) says can be helpful. X-rays organised by General Practitioners were used on a few occasions and two stress fractures were confirmed. The time limit of 4 - 6 weeks from the onset of a pain for a stress fracture to show on an x-ray, made this investigation of limited value since it takes this time for the healing callous to show. Clinical judgement, based on history, examination and the degree of bone tenderness, were more important.

Posterior tibial problems presenting with tibial pain were often related to increased tibial torsion or pronation (see Table 14A(ii)). Often a runner with these inherent abnormalities ran too much, too soon on road and often poorly shod. Pain was often progressive and if running was not stopped, began to occur even during normal activities. Ice is a particularly useful treatment. Ultrasound can be helpful but if there is a periostial involvement, /

/involvement, then it can be highly irritative and this is almost a diagnostic test. Transcutaneous nerve stimulation was found to have a surprisingly useful role in this condition. Physiotherapy strapping was occasionally helpful. Correction of errors and advice with particular regards to shoes is crucial and even a simple arch support can be virtually curative in some of these cases.

Anterior tibial compartment syndrome, tenderness on the lateral aspect of the tibia is more common in the slightly more advanced runners and overall is less common that the posterior tibial. Hill running, interval training and shoes with too flexible soles are precipitating factors. Again while ice, ultrasound, anti-inflammatories can control discomfort, attention was paid to correcting the faults, but also the runners were encouraged to stretch the calf and to strengthen the ankle compartment by doing bent leg ankle lifts. Tenosynovitis of the flexor tendons was also noted with marked crepitus and this responded spectacularly to ice and ultrasound.

Lateral compartment syndrome was noticed in 8 runners. Pain behind the lateral malleolus extending occasionally proximally, but more often distally, was the presenting factor. Weak ankles and hyperpronation with poor shoes were precipitating factors. Ankle exercises including isometrics are important as are stabilising shoes which control movement.

While the compartment syndromes produce their share of problems of classification and aetiology, it was fortunate that most of those presented at the Tryst occurred in inexperienced runners and were relatively easy to treat - none of the runners needed fasciotomy, though some were referred for Podiatrist advice. Perhaps some of the /

/the runners who travelled from further afield and presented in the early days of the Clinic, may have come to surgery at a later date, but certainly none of the local runners who are still in touch with the Clinic have needed surgery.

ACHILLES TENDON:

The Achilles tendon was found by Brody (35) to represent 20% of his injured runners and Sheehan (37) 12.5%. It is pleasing to report that in Cumbernauld this condition was only seen in 6%. This might indicate changes in runners habits or more likely in shoe design from the late 1970's when Brody and Sheehan were studying their runners compared with the early 1980's of the Tryst study. The majority of the Tryst cases were peritendonitis with swelling. Presentation was by pain on or after exertion, associated often with a stiffness on early morning rising. Examination revealed swelling and tenderness as being the major signs. The main biomechanical factor was the pronating foot. Hills, rigid shoes, and a lack of calf flexibility were precipitating factors. The cavus foot was also noticed in some runners.

Heel tab peritendonitis described by Sperryn (25) was common early in the Clinic's existence but now seems to be much less of a problem. This is probably because running magazines have made many runners aware of the condition and since many shoes now have an Achilles dip, the chances of heel tab pressure are less.

In 1982-83 runners with this problem were very resistant to performing the two simple slits in the heel tab which can be curative. It took a demonstration of the Medical Officer's own mutilated £50 worth of running shoes to convince some of the doubters. Treatment was with ice, ultrasound and heel pads to elevate and thus reduce tension on the tendon. This could be manufactured with Chiropody felt in ordinary shoes as well as in running shoes.

Runners were also recommended to use softer surfaces for running, to avoid hills and give appropriate attention to their shoes.

Steroid was not used for this condition and no patient needed referral for surgery. An improvement in Achilles problems for the ordinary runner is a good example of lessons being learned.

INFRAPATELLAR TENDONITIS:

Infrapatellar tendonitis was recorded in 22 runners at the Tryst but is only mentioned "en passant" by most authors with the exception of Grisogono (32). She states that it is an overuse injury due to repetition such as long distance running. She also states that fatigue and bad shoes might be a contributing factor. Anything that deviates the tendon from its pattern can cause this problem. The findings at the Tryst would agree with Grisogono's comments. It seems almost to be a variation on the same theme of patellar dysfunction. In this case the tendon seems to try and maintain the patella equilibrium and seems to suffer minor trauma which then becomes chronic. The chronic minor trauma inhibits movements and thus produces a continuing "vicious circle" of problems. Treatment is by relative rest, ice, ultrasound and correction of any obvious biomechanical abnormality.

THE CALF:

Calf strain and tear feature in the Tryst series with 19 injuries. This is given little prominence in textbooks with the exception of Sperryn (25) who thinks an age factor is an important aspect. At the Tryst while there was some evidence of calf problems amongst the veterans, fatigue and dehydration on a long run, particularly where a hill was involved, seemed to be a more important factor in causing these tears. Another major factor was failure to allow adequate /

/adequate recovery from a long run or a race. Often a further long run or fast session was incorporated before full recovery had been achieved. Foster, the famous New Zealand veteran Marathon runner, recommends that one should not run or race fast or hard for the number of days equal to the length of the race run in miles, i.e. after a 10 Km race, six days of gentle running should be allowed and after a Marathon, four weeks. This seems an excellent common sense suggestion. The calf strain is a common running injury and totally contrasts with the "Tennis Leg" sudden tear experienced in other sports.

Treatment with ice was carried out, ultrasound was particularly helpful in this condition, chiropody felt elevation in the heel followed by regular stretching were the mainstays of treatment.

MISCELLANEOUS KNEE PROBLEMS:

Posteriorly at the knee was a surprising area of injury with 9 in total. There were 3 Popliteal Cysts and no action was recommended unless they seemed to be causing problems. Two injuries seemed to be genuine capsular problems but there also seemed to be a genuine popliteous strain, almost certainly a function of vigorously stretched forced leg extension. Treatment was by ultrasound and ice.

THE FOOT:

Not surprisingly, since runners feet meet the ground 800-2000 times every mile, and this with a force of 3 - 8 times body weight, depending on the surface and the weight, the foot, as well as being the major villain in other injuries has distinct problems of its own. There were 21 injuries recorded in the foot at the Tryst: 9 involving the plantar fascia and spring ligament; 8 arch problems anteriorly and 4 with metatarsalgia. Plantar fasciitis presented with minor pain progressing to more severe pain, particularly in the /

/the morning. On examination distinct tenderness at the attachment of the fascia to the heel was the commonest. There was also a minor variation to this where the tenderness is not directly at the attachment but ½" - 1" towards the toe. Associated findings such as cavus foot, pronation, eversion of the heel, were commonly noted. Therapy included ice, ultrasound and transcutaneous nerve stimulation while a helpful measure was a horseshoe shaped pad in the heel of the shoe. This is one condition in which local steroid infiltration was a particularly useful role. If a chronic problem occurs then it is necessary to look at the shoe choice very carefully and to seek Podiatrist advice.

When arch problems occur time spent on teaching exercises for the intrinsic muscles of the feet can be very useful, e.g. picking up pencils with toes, towel "scrunching" and foot inversion with toe curls are the usual recommendations. Temporary arch supports or full orthosis may be necessary. Metatarsal pain occurs in runners who were still running on their toes or in those with major problems such as a weak arch, unstable heel or pronation. The advantage of a Physiotherapist who is skilled in strapping with chiropody felt and Elastoplast was demonstrated to the runners when dealing with this condition. Orthoses may sometimes also be necessary. Interestingly, no cases of Morton's Neuroma, a commonly reported occurrence in other studies, have been seen at the Tryst.

MISCELLANEOUS:

Some injuries which occurred in other sports also occurred in runners. Examples include Osgood Schlatters in a young cross country runner, ligament problems in the knee, either a function of previous injuries perhaps in other sports such as Soccer or Rugby or due to trauma while running. There were two cases where there seemed to be an overuse element related to a problem of knee stability. The adductor /

/adductor strain, beloved of footballers, occurred in 9 runners, usually either as a direct trauma such as a slip or as a function of high mileage. Factors associated with this included pronation, leg length discrepancy, poor shock absorption or bad running style. Ultrasound, transcutaneous nerve stimulation, gentle stretching and shoe attention are helpful.

As Table 14A(i) shows, a large number of injuries, 34 in total, are included in the classification Others. These represent conditions which were not seen in the first year of the Clinic's existence when the original classification was organised. An example of these conditions includes injuries which were relevant but not necessarily caused by running such as cervical spondylosis and scoliosis. The pain might well have been worsened by poor running form. Amongst the other small number of conditions seen were Hoffa syndrome, (fat pad impingement of the knee) which seemed to be a function of hill or speed work in the experienced runner, which responded to ultrasound or steroid injection. Heel pain of a bruised type also occurred and seemed to benefit distinctly from a Sorbothane pad in the shoe. Pump bump, a bursa at the calcaneum, lateral to the attachment of the tendon, was caused by poor shoes or, in one case, an ill fitting orthotic device.

As Table 10B showed, runners sought advice for medical conditions relatively more frequently than other sportsmen. The 10 outlined were only the tip of the iceberg as these are runners who consulted for this purpose solely. Frequently, the runners while attending for an injury, would ask about viral infections, gastrointestinal upset on a basis of "while I'm here Doc". These consultations included a runner who became anaemic because of gastrointestinal blood loss from usage of anti-inflammatory drugs. Advice on eating was often sought and they would be referred to Dr. Sheehan's dictum which is to run /

/run with the stomach and colon both empty (perhaps easier to say than to do). Viral infections seem to haunt runners and athletes. Perhaps stress, exhaustion, fatigue, either predisposed to infection or encourage re-activation of dormant viruses. Dr. Sheehan (37) suggested that Scientists studying the role of the virus could learn more on the track than in the Laboratory. Certainly runners who ran while viraemic or immediately after a viral infection seemed to ask for trouble such as poor performance, poor training, lack of zest if not downright fatigue. Dr. Sheehan suggested that the common cold very frequently follows a good performance and heretically suggests that the common cold is perhaps the most frequent overuse injury in runners. To quote Dr. Sheehan (37) "we do not catch colds, we run ourselves into them". Indeed running can be a fine tightrope balance between excellence and disaster. The message from the Tryst would echo Dr. Sheehan's comments but would also add that increase in mileage or pace after an infection, sometimes seemed to precipitate an injury.

SHOES:

Throughout this account of the runners injuries the role of the shoe features as a major factor. In a perfect world everyone might be able to run barefoot but neither the foot nor the world are perfect and shoes are required. Unfortunately many runners do not run in adequate shoes for the mileage they intend to run. There is no place for the plimsoll, the tennis shoe, the football trainer, in training for a Marathon. 392 injuries occurred in 275 individual runners. 20 of those had made an unwise choice of shoes (probably the lowest estimate as not all runners had brought their shoes and only when there was definite evidence of a direct link from shoe to injury was this recorded). Even more surprisingly, having made a reasonable choice /

/choice, 60 of the injuries showed evidence that the shoes were damaged to such an extent that they might well have influenced or created the injury. Thus we can see that in 20% of all running injuries, the shoe has an influence and 30% of all runners made serious errors in shoe choice or care at sometime in their career.

A good running shoe would include adequate fit lengthwise, about half an inch longer than the toe, and adequate width which can sometimes be difficult to achieve. A good toe box, rounded and one and a half inches high to prevent toe damage, is essential. The role of heel tab surgery in Achilles peritendonitis has been mentioned previously. A firm heel counter adds to rear foot stability. The heel should have a rounded edge with slight flare as described by Sperryn (40). Multiple layer sole and heel, with flexibility, but not too flexible, complete with a hard outer sole and adequate traction for whichever surface, complete the perfect running shoe.

A frequently asked question at the Tryst would be "what shoe would you recommend Doctor". This is an unanswerable question but advice about the type of shoe, i.e. those marketed with anti-pronation, and those relevant to the heavier runner, is a reasonable response but specification of shoes or brands is not. The more important answer to give to the injured runner is that the shoe should be purchased at a shop sympathetic to runners with knowledgeable assistants. Time should be taken about the choice and purchasers should feel under no pressure to complete the purchase if he does not find a suitable shoe. This is particularly relevant when one considers the cost of many current running shoes. Having found a good and suitable shoe, a runner should try to stay with it and not be seduced by adverts and /

/and new advances. A good shoe can save a runner from potential injury. Proper maintenance, particularly to the lateral aspect of the heel which usually wears down, is also essential. Sheehan (37) states that the greatest asset an athlete can have is a well fitted shoe. The Tryst would say Amen.

PODIATRIST AND ORTHOSIS:

In discussing running injuries there has been mention of the role of the Podiatrist - a chiropodist interested in the biomechanics of the lower limb - and orthotic devices - a support placed in the running shoe to compensate for biomechanical problems and to prevent abnormal motions during running. This definition includes strapping and felt pads used, e.g. in Achilles peritendonitis problems.

48 runners were referred for Podiatrist assessment from the Tryst Clinic. This was for assessment and they obviously did not all need orthotics. This represents 12% of all running injuries and 17% of all runners. Brody (35) in Washington, reckoned that one third of his runners needed orthotic correction though he includes in this series those requiring simple supports. Sperryn and Restan (41) in England, in a study of 398 injured athletes, prescribed orthotics for 50. The majority, 32, being for distance runners. This figure would appear to be very similar to the Tryst as not all the Tryst referrals ended up with orthotic devices.

Podiatrist advice available to the Tryst has varied through the years of the Clinic. Initially, only a commercial service from Langer Laboratories via a Glasgow chiropodist was available. Consultation fees were about £15 - £20 and the device, a complex individually casted orthotic, known as "Sporthotic" cost over £70. This Podiatrist later retired and the servicing of such devices from Langer is maintained by a Podiatrist in Glenrothes. By 1983 the Chiropody /

/Chiropody School had established a Runner's Clinic in the Pollock Baths of Glasgow District Council. This was a donation type service assessing and making less expensive devices. This clinic disbanded and returned to the Chiropody School where a service is still maintained during daytime school hours. This service was very patchy but undoubtedly gave benefit to many runners and some runners obtained the financial bargain of the decade. The Lecturer in charge of the Chiropody School Clinic, Mr. Jim Black, later commenced private practice and he is now the main recipient of such referrals. The criterion for referral was a running over-use injury directly related to biomechanical abnormalities that could not be adequately treated by other means. Brody (35) stated that his devices were used to prevent excessive pronation and that the devices helped in "shin splints", chondromalacia patellae and foot injuries. Sperryn and Restan (41) list foot pain (38%), anterior knee pain (34%), ankle pain (30%) and Achilles tendon (16%) as injuries that required orthotic assistance in their experience. The Tryst would agree that patello femoral dysfunction, anterior compartment syndrome, foot problems and occasionally ankles, benefit from orthotic device. There is also a role in some hip and back conditions. Sperryn and Restan (41) followed up their patients fully and discovered that only 54% of the patients were still using the device at the end of three and a half years. They stated that appropriate patient selection was crucial. They go on to add that commercial companies were exploiting the field and since only two thirds of all runners benefited at all and since half no longer wore the device, critical care and selection was required on both both clinical and economic grounds. Sperryn's criticism of the commercial companies contrasts with the comments of Subotnick (42), the famous /

/ famous American Podiatrist who has treated many runners. He states "almost every athlete would benefit from some form of foot support or some form of shock absorbing material within the shoes". While making allowances for Subotnick's obvious commercial interest, there is a probable grain of truth in his statement although correction for the sake of anatomical perfection rather than treating injury is wrong. The engineer's maxim "if it works don't change it" has some sense.

Philosophically the Tryst would be somewhere in the middle of the two views of Sperryn and Subotnick. A recurring overuse injury not responding to stretching, intelligently planned running and good shoes, needs the opinion of a Podiatrist and may need an orthotic device.

Future care of the orthotic device, if one is supplied, is very relevant as at least two injuries reported to the Tryst were due to neglect of the device. Equally appropriate, adjustment and "running in" of the device are important to its success. Hopefully the reduction in running injuries and the improvement in shoes may make the needs for orthotics less in the future.

INJURIES RELATED TO MILEAGE PER WEEK AND EXPERIENCE AS A RUNNER

TABLES 14A (iii) and 14A (iv)

Analysis was made of the major running injuries and the relationship to the weekly mileage prior to the injury and also to the runner's experience. A problem with this type of analysis is that there is no true denominator - nobody knows how many people run, for how long they run, how many years they have been running. Another problem in the analysis is that records in use in a busy Clinic are not always recorded with the amount of detail that a subsequent researcher might desire. If the mileage was not always recorded this was due to either the pressure of time and note-taking on the part of the Medical Officer, or less likely, in that it seemed to be irrelevant at that time to the injury. There were 203 injuries in the categories included in this study - acute inversion injury of the ankle was excluded because mileage and experience were deemed to have little relevance to this injury. Information was available on 135 of these runners with regards to weekly mileage and in 129 with regards to their experience of running. These tables are presented as Table 14A (iii) and 14A (iv). These tables were subjected to statistical tests and found to have a P value of less than 0.0006 and 0.0007 but there was a caution in that many of the cells were less than 5.

Brody (35) is one of the few authors to attempt to categorise runners - he uses the expression jogger or novice - running three to twenty miles per week at 9 - 12 minute mile pace- sports runners 20 - 40 miles per week and long distance runners 40 - 70 miles per week at seven or eight minute mile pace competing in 10K's races or Marathons. This is a very arbitrary division as there were runners who attended the Tryst who were running 35 miles per week at six minute mile pace but still in their first year, and hoping to run a Marathon in about three hours. Yet this type of runner does not fit into any of Brody's patterns thus categorisation can be difficult, but as the Tables show, there were some interesting /

TABLE 14A (iii) INJURY PER MILES PER WEEK:

INJURY	TOTAL NOS INJURED	TOTAL NOS INFO AVAIL	LESS THAN 10 MILES P/W	11-20 MILES P/W	20-40 MILES P/W	40+ MILES P/W
PATELLO FEM DYS	61	42	10	13	9	10
ILEO TIBIAL BAND SYND	44	29	0	5	21	3
CHRONIC ANKLE PROBLEMS	15	14	2	3	9	0
BACK PROBLEMS	24	15	0	3	4	8
POST COMP SYNDROME	23	15	1	1	8	5
ANT COMP SYNDROME	14	8	0	1	5	2
ACHILLES TENDONITIS PERI TENDONITIS	22	12	1	4	4	3
TOTAL	203	135	14	30	60	31

TABLE 14A (iv) INJURY PER EXPERIENCE AS A RUNNER:

INJURY	TOTAL NOS. INJURED	TOTAl INFO AVAILABLE	LESS THAN SIX MONTHS	6 - 12 MONTHS	1 - 3 MONTHS	3 + YEARS
PAT. FEM. DYS.	61	39	18	0	14	7
ILEO TIBIAL BAND SYNDROME	44	27	1	11	15	0
CHRONIC ANKLE PROBLEMS	15	11	3	4	4	0
BACK PROBLEMS	24	16	4	1	1	10
POST COMPARTMENT SYNDROME	23	16	2	0	10	4
ANTERIOR COMPARTMENT SYNDROME	14	8	0	0	6	2
ACHILLES TENDONITIS/ PERITENDONITIS	22	13	4	0	8	1
TOTAL	203	130	32	16	58	24

/interesting features in this analysis.

Patello Femoral Dysfunction, the commonest running injury was found more frequently in low mileage runners with a significant standardised residual. It does, however, seem to be less likely in the more experienced runner with only 17% of those with this condition having been running for more than three years.

The role of Patello Femoral Dysfunction in a more experienced runner is related perhaps to return from another injury or illness, and this has been discussed previously in the analysis of this injury. There might, however, be another factor which the Injury per Mile Table suggests. It might be possible that there is a "biomechanical threshold of mileage" attainable without injury for a given individual. Few individuals are perfect in the muscle and skeletal factors which are relevant to running and thus if the mileage is increased there may be a point when these factors are not able to be corrected, and this may cause a predisposition to injury such as Patello Femoral Dysfunction. Certainly, this seemed to be present in some runners who presented at the Tryst.

This concept might sustain some support from Sperryn (25) who describes runners who say that they run 100 miles per week but are reduced because of injury to 40 miles per week, and who, when averaged over a period of the time, seemed to average a weekly mileage of 60 miles per week. Sperryn suggests that if they trained steadily at 60 miles per week, they would be a better runner and reduce the number of injuries they suffer. There might be some evidence for this in the experience/injury table where Patello Femoral Dysfunction is common from six months to three years but relatively rare after this (having a negative standardised residual on analysis). Perhaps by then the runner has learned his own particular threshold of training.

The Ileo Tibial Band syndrome corrolates with certain mileages and a lack of experience. It was most common between 20 - 40 miles per week and rare after three years of running (with a negative standardised /

/standardised residual of 2.8). Presumably, once again, lessons have been learned.

Information was available on a small number of runners who suffered from chronic ankle problems relating to ligament strain produced by running. Runners with acute inversion injury were excluded from this study as this injury was deemed to be more random and associated with factors not directly related to mileage. Retrospectively, this conclusion might not be correct and it would have been useful to know if high mileage increases the probability of an acute inversion injury. This aspect will have to wait for further study. Most of the runners with chronic ankle problems were in the category 20 - 40 miles per week - enough miles to cause their problem and possibly it is difficult with this problem to obtain a higher mileage. Again, experienced runners seemed to be able to overcome this problem as no one presented with this problem who had been running for three years. (A significant negative standardised residual was obtained on statistical analysis.) Alternatively, there may have been people who were forced to abandon running because of having suffered from this injury.

In contrast to the ankle problems, the experienced runner with a high mileage is prone to back complaints. Standardised residuals of plus 3 were found for 40 miles per week and 4.85 for three years of running. In this aspect, the Tryst study agrees with Brody (35) who found that back problems were much more common in the serious long distance runner. Sperryn (25) also records it is common amongst the long distance runner. In the Tryst series, 12 of the 15 patients with back problems, were running over 20 miles per week and 8 over 40 miles per week. In terms of experience, 10 out of 16 had been running for over three years. Sperryn (25) maintains that hard surface running, limb lengths discrepancy, scoliosis and congenital abnormalities contribute to this problem. Certainly these abnormalities would seem to be more relevant after years of high mileage /

/mileage running rather than at novice level. It is important that high mileage runners maintain their abdominal musculature with adequate strength and should ensure that their hamstrings are also flexible, as weak abdominal muscles and tight hamstring problems can certainly contribute to lower back problems in runners.

Posterior Compartment Syndrome may occasionally present early in a running career if there are major biomechanical abnormalities and too rapid a build up in a mileage, but it also occurs in those above 20 miles per week after three years running. On statistical analysis, there was no major statistical occurrence in any of these categories. Sheehan (37) finds that this condition relates to changes in shoes and to doing speed work. The speed work aspect certainly seems to have been found relevant at the Tryst.

The Anterior Compartment Syndrome is related to changes to a toe running style and intervals of hill training running according to Brody (35) and these runners would tend to be more experienced or increasing their training. This is confirmed in the Tryst series when the anterior compartment was found in the more experienced runner.

Achilles Peri Tendonitis unless related to heel tab problem in the shoes (q.v.) tends to occur after a year and with a higher mileage, possibly related to hill running. Brody (35) and Sheehan (37) recognise that Achilles tendonitis occurs later in training for a Marathon, particularly with the addition of hill work and speed work. Sheehan encourages calf stretching as a preventive measure. This the Tryst study would also endorse.

Analysis of mileage and experience related to injury produced a distinct pattern. To the novice with his problems of Patello Femoral Dysfunction or perhaps heel tab peritendonitis of the Achilles; in the middle stage with the ileo tibial band and some compartment syndromes and finally, the serious runner with his back injury.

There may well be a large element of truth in the cliche frequently /

/frequently used by runners that "There is a last injury, the current injury and the next injury". However, since the Clinic does not see the uninjured runner and there is little evidence to quantify the number of people running, such cynical opinions do not yet have scientific validity. There is, nevertheless, a pattern to running injuries related to mileage and experience.

RUNNING CONCLUSIONS:

Having observed and chronicled the Scottish "Running Boom" what lessons can be learned. Certainly the benefits outlined by many proponents (4) (5) and (7) are evident. The pleasure and self esteem of sedentary people who have become runners is obvious and has to be encouraged. The fact that the Glasgow Marathan was the catalyst provoking these changes in lifestyle is a double edged sword. The challenge of the Marathon was obviously a powerful motivating factor, but equally, attempting to run a Marathon in under a year from being a non-active person, while being perfectly feasible is not the ideal way from point of view of injury prevention. In some ways it is a pity that the race which caught the Scottish public's imagination was not a shorter race such as "Bay to Breakers" in San Francisco which is eight miles long.

Most running injuries occur in the novice and are often due to elementary errors. Too much, too soon, on the wrong surface, poorly shod, is a familiar tale. The early injuries may also be a function of minor abnormality that needs correction, e.g. vastus medialis strengthening or the addition of stretching. While some top class runners do not stretch, Frank Shorter, the famous American runner and Lesley Watson, the famous Scottish running physiotherapist are examples of this, the message from the Tryst is that if every runner should not stretch, then certainly the aged (above 25 years) or the injured runner must stretch. Sheehan's advice (37) that "all stretching should be done with the speed of a glacier and the patience of a yogi" is well worth repeating. The decline in the number of injured runners, while reflecting a decline in the total number of runners and also the availability of help nearer their home through other sports injury /

/injury clinics, reflects a genuine decline in the number of injuries sustained by runners. This is borne out by personal contact with the runners, either at the Cumbernauld Half Marathon, where the Clinic supplies medical and physiotherapy cover, or at races in which the Medical Officer has been a participant, and jocular remarks of "long time no see" are greeted with the reply "nothing serious Doc". These findings are also borne out in the United States where the running magazines whose standard of medical writing is generally superb, state that there is a distinct reduction in runner injury due, they believe, to better education, better shoes with better cushioning, shoes with motion control and high quality and finally, runners running more sensible mileages. Cooper (43) in his most recent book, states that the studies at the Institute for Aerobic Research in Dallas show that the injury level is minimal for those running 1 - 20 miles per week, and it increases exponentially as the mileage increases. He also states that if someone is running more than 15 miles per week, he is running for some other reason than basic cardiovascular fitness. The study at the Tryst would support this contention with two important provisos - that once the occurrence of novice type injuries are past and the runner reaches a steady state of 15 - 20 miles per week, then injuries are rare, and secondly, that high mileage runners can remain injury free if their training programme is in equilibrium. They receive their injuries when they change their pattern, e.g. altering their shoes, neglect of shoes or changing of the type foolishly. Other examples of this change in pattern would be an increase in mileage suddenly or a change in type of training too rapidly, namely speed work or hill work, over-racing and over-working. When equilibrium is disturbed, there is a significant risk of injury.

In general, it is a pleasure to help runners to obtain their goal, and when the Glasgow Marathon finally disappeared in 1988 the celebrations held at the Tryst on the following Monday were sadly missed.

TABLE 14B INJURIES TO FOOTBALLERS:

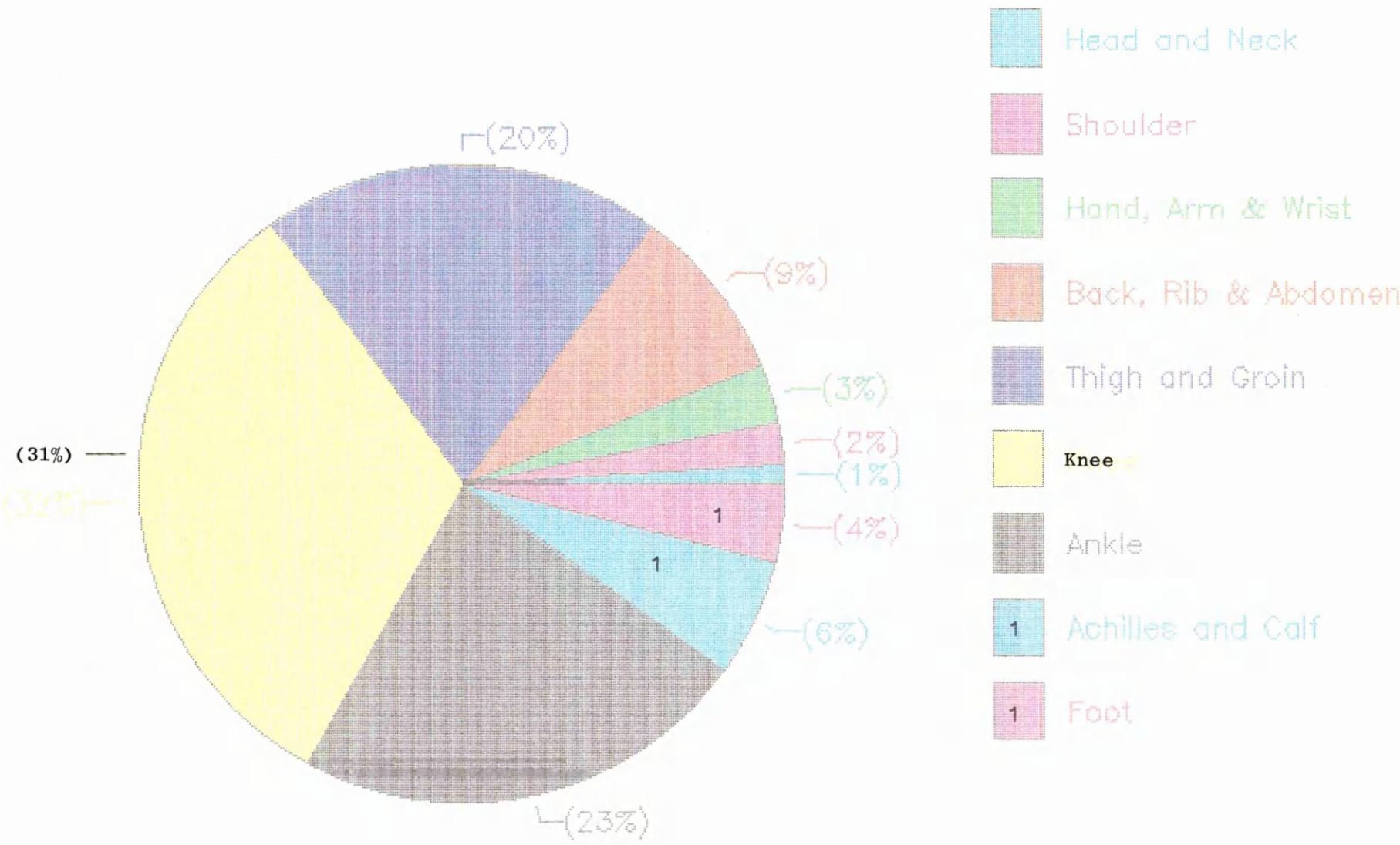
Football, according to its national organisation, F.I.F.A., is the most popular game in the world and the fastest growing. It is strong in Scotland and traditionally so in Central Scotland. In the Cumbernauld and Kilsyth District there are no senior teams but two junior teams, Kilsyth Rangers (Premier Division, Central League) and Cumbernauld United (Second Division, Central League). Most of the local amateur teams compete in the Stirling and District Amateur League. There are 15 teams from Cumbernauld and Kilsyth in this League. There is a flourishing 14 team Sunday League. Many schools still play despite the recent Teacher's dispute and there is an active Boys Club League with almost a dozen clubs in each of the single age group categories. Boys Brigade football is flourishing and there are even two female clubs in Cumbernauld.

Therefore, it is not surprising that over 300 injured footballers presented for advice and treatment at the Tryst. Sandelin (44) in an extensive study of Finnish football, showed that 5.8% of all footballers were injured in the season. He also compared this figure with one of 10% from West Germany and 2.6% in the United States. Since the Finnish study covered all the national leagues run by the National Association at adult level, it would seem to give a realistic figure. They recorded that 64% of the injuries were in the lower limb. The Tryst figure for the lower limb was higher, being 85%. The difference between these two studies was that the Finnish study was all embracing, including players with concussion, lacerations and fractures who would not attend a Sports Centre Injury Clinic. The Finns found the knee and the ankle to be the main /

TABLE 14B INJURIES TO FOOTBALLERS

NECK AND SHOULDER INJURIES		10
HAND, ARM AND WRIST		9
RIB		3
BACK		
Muscle Strain	7	
Haematomas	5	
S.I. Strain	8	
Disc Lesion	3	
Sciatica	2	25
GROIN AND THIGH		
Adductor Tear/Strain	20	
Sartorius Strain	2	
Pubic Symph. problems	2	
Quadriceps Haematoma	6	
Quadriceps Tear/Strain	13	
Hamstring Tear/Strain	18	61
KNEE		
Pat. Fem. Dysfunction	9	
Osgood Schlatter	5	
Infra. Pat. Tendonitis	5	
Popliteal Tear/Strain	8	
Med. Lig. Tear/Strain	38	
Lat. Lig. Tear/Strain	6	
Meniscus Lesion	9	
Effusion	7	
Hyperextension Injury	1	
Haematoma/Trauma	4	
Ant. Cruciate damage	5	97
ANKLE		
Acute Inv. Inj.	48	
Chronic Ligament Problems	12	
Eversion Injury	2	
Lat. Peroneal Syndrome	3	
Trauma	6	71
ACHILLES/CALF		
Achilles Tendonitis/Tear	9	
Gastroc. Tear/Haematoma	6	
Shin Haematoma	4	19
FOOT		
Heel Trauma/Severs	7	
Trauma	3	
Ligament/Arch problems	3	13
		308

TABLE 14B
INJURIES TO FOOTBALLERS



/main areas injured and this was typical of the Cumbernauld and Kilsyth footballers. There are several patterns which emerge in analysis of Table 14B.

Back injuries featured either as direct trauma in the form of a direct blow or more commonly, in the form of a twist or strain while jumping to head a ball or landing after heading. Another source of back injury was a lunge into a sliding tackle.

The adductor strain was a frequent occurrence, often recurrent, and can be awkward to treat particularly if related to the tendon periosteal junction. Muckle (45) mentions contributory factors to the groin strain and the Tryst study would certainly agree with the suggestion that thoracic and lumbar spinal problems are relevant. There has been no evidence of any rheumatic disease or obvious hip abnormalities in the Tryst series.

The frequency of adductor strains and also the high number of hamstring strains and tears seen at the Tryst are related to an exceptional lack of flexibility amongst Junior and Amateur footballers. This poor flexibility of footballers might be dismissed as being a function of casual attitudes to training but this was not the case. The Junior clubs and many of the best Amateur teams train regularly and conscientiously on at least two evenings per week. However, on hearing descriptions of these trainings and pre-match sessions, there is little evidence of stretching type exercises performed other than a very casual adductor stretch. Some Rugby players have similar problems but not nearly as many, nor such an obvious stiffness as there was amongst the footballers. If nothing else has been learned in the past five years study at the Tryst, then this one fact alone would be worth passing on into common knowledge. Another unique feature of the footballers was the number of players who presented having strained or torn their quadriceps when kicking /

/kicking a dead ball. This was either the goalkeeper or an outfield player hitting a goal kick on two occasions, a corner kick or a player having his empty kick blocked by an opponent. Again, perhaps a degree of flexibility might have been a preventative factor. Despite its importance, the thigh was not the main injured area in footballers, rather it was the knee and ankle.

The injury to the knee dominates soccer. The Finnish study (44) showed an involvement in 29% of all football injuries and King writing in "Sports Injuries and their Treatment" (24) quotes the study of a professional football club and a good amateur club in which 15% of the problems were at the knee but that 40% of the total time lost because of injury was directly related to the knee. Two players in his study had their sporting careers terminated by knee injuries.

The presentation at the Tryst of 9 players with patello femoral dysfunction seemed to be a function of the running component of training or of poor quadriceps development or of the special biomechanical features of the female leg. Osgood Schlatter's condition was diagnosed in five young players, one of whom was regularly playing four competitive games per week as well as his normal training. One advantage of practice in a Sports Injury Clinic as compared with practice in a General Practitioner's Surgery is that the appropriate relevant rest for this condition has a slightly better chance of compliance because of the ethos of the Clinic.

Although the Tryst Sports Clinic was basically a primary care unit, with the major knee injuries involving damage to medial or lateral ligaments, meniscal tears or anterior cruciate damage, there was a distinct overlap with secondary care. Most of these injuries had attended a Hospital Casualty Department at some point, some had attended an Orthopaedic Surgeon while others waited to do so. Two patients attended with their knee still locked and unable to extend. Judging from the attendance at /

/at the Tryst, it has to be said that Accident and Emergency care of the injured knee is of patchy quality.

In dealing with the injured knee, the history and mechanism of the injury are important. The Tryst Clinic offered more time to take a thorough history with fifteen minute or longer appointments available. The injured sportsman has a tendency to believe that examination is most important and displays a desire immediately to mount the examination couch for the instant answer. Time spent taking the history is time well spent. In particular, definition of what the patient means by the phrase "locking" is crucial, as often on further questioning it turns out to mean stiffness rather than true medical locking.

The Medial ligament injury seems to be caused most frequently by the tackle - foot or leg blocked by an opponent while in motion causing the distortion. A typical impact against the knee while the foot is stationary "opens" the opposite side damaging the ligament. This is most common where there has been a blow to the lateral aspect damaging the medial ligament. Another mechanism involving the tackle is when the foot is trapped and the player falls to the lateral side. Rotation also seems to have a role to play in medial ligament damage although if there is rotation and flexion in the movement, e.g. the trapped boot in full rotation, there must be a high degree of suspicion that there is meniscal damage. Sometimes the distinction between medial ligament damage only and medial ligament damage plus meniscus damage can only be adequately made after return to activity when the meniscus tear sometimes becomes more obvious.

The seven effusions recorded were where the initial diagnosis was not possible at first presentation and the patient either did not return for follow-up or the follow-up diagnosis was not adequately recorded. Presentation of injury as demonstrated in Table 9 was very variable and this was reflected with the knee injuries. Ideal presentation of the injury at 48 hours after its occurrence with a weekend of rest, ice, /

/compression, elevation were rare even in those who attended Accident and Emergency Departments immediately after their injury.

Most of the injuries were of the Class 1 and 11 strains with laxity being less than 10 mm of excess. Where ligaments were more seriously lax, orthopaedic attention is essential. There was however one chronic injury in an ex professional footballer, which had undoubtedly been a Class 111 injury which was not surgically treated at that time. Early treatment was by ice, properly applied physiotherapy strapping, ultrasound and quadriceps exercises. Treatment in the later presenting cases involved short wave diathermy or interferential and quadriceps exercises. Quadriceps muscle rehabilitation is the "sine qua non" of knee ligament rehabilitation. Isometric exercises were commenced as soon as possible after an injury. In the earlier stages just passive contraction was permitted then very rapidly moving on to straight leg lifting. This took the form of six inches from the horizontal with the toe curled, held initially for ten seconds, repeated on ten occasions three times per day. Gradually the time was increased and then a gentle increase in weight added to the foot. Later bent knee quadriceps movements, either at home sitting on a kitchen table, or on the appropriate apparatus of the conditioning gym. At this stage there was the introduction of hamstring exercises in the conditioning gym to prevent an imbalance developing and improve control of rotation. While this is possibly more important in the cruciate tears, it is also not irrelevant to the simpler conditions. Kneeling and weight bearing knee bends provide a path back to activity beginning with steps up and gentle jogging. This is then followed by change of direction type movements with side stepping and 70% sprinting and figure of eight running, training exercises and finally, return to sport.

A major feature of many of the sportsmen attending who had sought advice at Accident and Emergency Departments or General Practitioners or even on one occasion, at Orthopaedic surgical level, was the failure to be given, or perhaps more likely, failure to comprehend the importance of muscle rehabilitation.

Kannus (46) reported on a Finnish study on the long term prognosis of knee ligament injury treated conservatively and concluded "the amount of static knee instability and post traumatic osteo-arthritis depended much more on the seriousness of the primary ligament injury than on muscle performance of the injured extremity, BUT, by adequate thigh muscle rehabilitation, the objective and functional status of the injured knee can be significantly improved. Sport at the level of competitive activity seems an excellent means to achieve the best possible subjective and functional result after knee injury".

This paper did not define what was meant by competitive and spare time sportsmen nor whether ligament injury involved cruciate and/or medial ligaments. However, while not able to comment on the long term aspects mentioned, the Tryst Clinic would certainly endorse the suggestion that well motivated sportsmen can produce an improvement in their muscle strength to allow functional stability. One attending footballer summed it up rather nicely by saying that with good thigh muscle, you could cover a multitude of sins in the knee. With reference to the more serious injury of meniscal damage, these were either acute and referred to hospital, particularly if the knee was locked, or referred via their General Practitioner to an Orthopaedic Surgeon. Some sportsmen attended for advice on rehabilitation where the same important muscle rehabilitation lessons applied. A distinct difference was noted between the patient who had open menisectomy and one performed by arthroscope in terms of less morbidity and more rapid rehabilitation after the latter procedure. Anterior cruciate damage in the footballer presenting at the Tryst was almost always old in time. One rugby player appeared to have a fresh injury and was referred to hospital. It is possible that some of the effusions which did not return to the Clinic had some form of anterior cruciate damage. Despite current thoughts, particularly in the United States,/

/States, about repair and augmentation in acute anterior cruciate ligament damage (47) no patient presenting at the Clinic nor any patient known to the Medical Officer, either in General Practice, or in the sporting world, seemed to have had this type of surgery performed. Certainly McNicol (48) and King (24) in the United Kingdom are not as keen as their transatlantic cousins.

The final conclusion must be that whatever the knee injury, whether operation is performed or not, rehabilitation and regular exercise for the rest of their sporting life (if not chronological life) are mandatory.

In Cumbernauld footballers were the most likely sport group to sustain an inversion injury. The inversion injury presented in three different times. One group presented early, 48 hours after the injury which was ideal for treatment. The second group attended 2 - 4 weeks after injury following limited progress based on either Casualty or General Practitioner advice. The final group had chronic ankle weakness which persisted for over three months. Treatment in the early stages was ice, compression, elevation followed by ultrasound therapy and transcutaneous nerve stimulation.

Strapping of the ankle was widely used in this condition both in the acute stage and in the chronic stage and it helped to allow participation in sport. A basic strapping of Elastoplast started at the medial border of the foot proximal to the first metatarsal head and plantar aspect of the foot and was drawn into a figure of eight shape round the ankle. This was applied with the foot held in slight dorsi-flexion and eversion. Depending on the severity a tarsal pad could be applied beforehand.

For the most severe injury, the pad was applied first, then three layers of strapping followed by stirrups of one inch zinc plaster over the lower one third of the medial and lateral aspect of the legs as a reinforcing band. Zinc oxide was always applied to both sides to minimise the danger of an eversion injury. Strapping was reduced as the ankle improved. For the patient with persisting weak ankle after treatment, /

/treatment, a basic strapping without zinc oxide is advised only when participating in sport.

The mainstay of treatment was a detailed exercise programme given as a handout to all those injured so that they could put the exercises into practice on a domestic basis. This was given to all types of injury, whether acute or chonic, but was specifically tailored for the acute injury. Damage to proprioception and sense of balance are a major factor in instability of the ankle and exercise to improve this was started as soon as the patient could manage.

First exercises, which were repeated three times per day, involved standing on one leg and holding balance. Following on the same exercise, but with the eyes closed and then raising the hands above the head. The final aspect of this exercise involved a degree of ball throwing while balancing on one leg. The second exercise was tip-toe standing which is an excellent test of ankle balance. This was performed initially on the floor and then on stairs, above and below the step. Wobble board exercises followed next, although a major problem at the Tryst was wobble boards being lent out and not returned. The Clinic now does not lend wobble boards but gives advice on how to make one, with a piece of flat wood and a rolling pin. The new child's toy, known as a "Lo Lo Ball" or "bouncing ball", seems to be a reasonable substitute.

The incidence of inversion injury of the ankle was such that football clubs who organise circuit training as part of their training should seriously consider using a wobble board as one station on their circuit.

Isometric exercises to strengthen medial and lateral stabilisers of the ankle, without risk of movement which would make the injury worse, were also started early. The first exercise involved putting the uninjured foot sole on top of the injured foot's dorsum. Both feet then press against each other without movement for five seconds. Exercises involving /

/involving pushing the outer and inner edge of the injured foot against a fixed object, without movement, were also held for five seconds. The recommendation was to repeat each five second hold ten times on three occasions during the day.

When the patient had managed the balance exercises and could walk with a degree of confidence, dynamic exercises were introduced. Slow dorsi flexion of the ankle, while sitting on a table with a small weight at the foot, - a handbag, was the first exercise. The patients then proceeded on to hopping, side-steps, skipping and gentle ball kicking. Finally, with shuttle runs, bench jumps and a running backward figure of eight with progressively smaller loops, the patient was considered to be fit for sporting activity. These exercises have been very useful in rehabilitating sportsmen and even some chronically weak ankles responded satisfactorily to this regime.

Thus, the main feature to emerge from the study of the injured footballer would be to encourage increased flexibility and thorough rehabilitation of the knee and ankle.

TABLE 14C INJURIES TO RUGBY PLAYERS:

There has always been a close link between Rugby Football and the medical profession. Amongst the founding clubs of the Rugby Union was Guy's Hospital. The Hospital's Cup in London is the oldest Rugby Cup in the world. Many Doctors have been capped for their respective countries although in modern times, with the honourable exception of the Irish, this is becoming less common reflecting that the time and commitment required for International Rugby in the 1980's is not easily compatible with a medical career.

This relationship has led to many excellent studies of rugby injuries of which the highlight was an International Conference on "Injuries in Rugby Football and other Team Sports" organised by the Irish Rugby Union as part of their 1974 Centenary Season (49).

The Tryst Study of 121 Rugby footballers reflects many of the major studies. By the very nature of the Clinic, many injuries were excluded such as minor trauma, lacerations or abrasions and also major accident and emergency injuries such as fractures. Many players however attended for rehabilitation after fracture or after their knee injury which they originally presented to the Accident and Emergency Department.

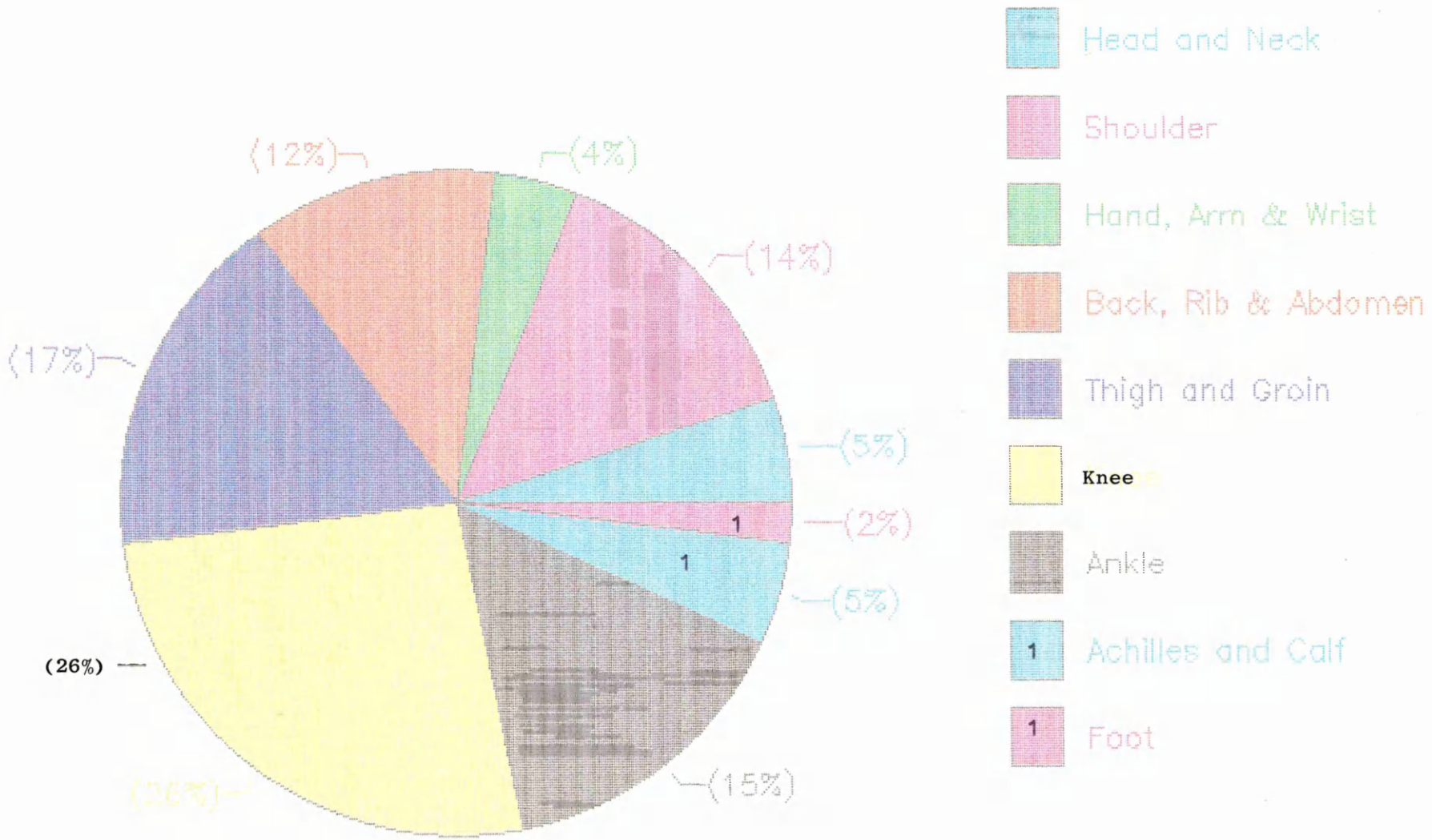
Cumbernauld and Kilsyth is not renowned for Rugby with only a relatively new Club, Cumbernauld Rugby Football Club founded in 1970, operating four XV's and one under eighteen XV. Some other players who reside in the District travel to play for Clubs in other districts. Also, players from Glasgow, Lanarkshire and Strathkelvin chose to travel to attend the Clinic. However, the majority of the players were from Cumbernauld Rugby Football Club. The numbers attending varied from year to year and this was perhaps a reflection of Cumbernauld Rugby Football Club's performance in the field. As the small table overleaf shows, it relates the /

TABLE 14C INJURIES TO RUGBY PLAYERS

HEAD		2
NECK		4
HANDS AND ARMS		5
SHOULDERS/CLAVICLE		
Dislocation	1	
Muscular	8	
Ac. Clav. Sublux	8	17
RIBS		3
BACK		
Muscular Strain	4	
S.I. Strain	2	
Disc Lesion	3	
Sciatica	3	12
GROIN AND THIGH		
Hip Problem	1	
Adductor Strain/Tear	3	
Quads. Haematoma	8	
Hamstring Tear/Strain	6	20
KNEE		
Pat. Fem. Dysfunction	4	
Popliteal Strain	1	
Med. Lig. Tear/Strain	11	
Lat. Lig. Tear/Strain	7	
Meniscus Lesion	3	
Effusion	4	
Cruciate Damage	1	31
ANKLE AND ACHILLES		
Inversion Injury	15	
Eversion Injury	3	
Achilles Tendonitis	3	21
CALF AND SHIN		
Calf Tear/Strain	3	3
FOOT		
Trauma	3	3
		121

TABLE 14C

INJURIES TO RUGBY PLAYERS



/the number of attendances at the Sports Injury Clinic to Cumbernauld's position in the S.R.U. Leagues.

YEAR	1982-83	1983-84	1984-85	1985-86	1986-87
No. of Injured Players	38	33	18	17	12
Cumbernauld's position in S.R.U. Leagues	*73rd	77th	78th	**83rd	91st

*Just missed Promotion **Relegated

From this one might conclude that if a Club is going for promotion then the players either have a greater incidence of injury or more likely, a desire to return to the team quickly and thus go seeking medical advice more frequently. The team's morale being high and the desire to return to the game are undoubtedly the factors in this fluctuation.

Attendances by other Clubs represented either local knowledge of the Clinic or at the time, there being no other geographically nearer source of advice or treatment to the patient's own Clubs. The Tryst numbers were small compared to the studies of adults (49) and in schoolboys (50)(51). There are a number of very similar themes which can be highlighted even in this number.

One patient required advice on recurring head injuries, perhaps a function of his disobedience of the S.R.U. advice barring play or training three weeks post concussion. Although Dr. Allemendou (49) and Dr. Spark (51) found the head most frequently injured, normally concussions and lacerations would not present to a Clinic like the Tryst.

The neck was a source of presentation of four players at the Tryst all of whom were prop forwards. Two of these players were advised that they were taking unacceptable risks by continuing to play in the front row, although whether they accepted this advice was doubtful.

Both of these had significant arm pain and /

/and paraesthesia and marked changes on x-rays obtained via their General Practitioner.

In France subluxation of the acromio clavicular joints is regarded as "the rugby injury" (49). Eight of these injuries were treated at the Tryst. Direct contact with the ground seemed to be the main mechanism of this injury. Ultrasound was found to be very useful in this condition and steroid injection was used only for the resistant case. Since muscular injuries around the shoulder and also advice on post-dislocation rehabilitation were fairly common and were reported in the other studies, there might be a case for speculating that some safe padding could be applied to rugby jerseys as a possible protective measure.

The next injury, almost synonymous with rugby football, was the haematoma of the quadriceps muscle, inevitably the result of a direct blow. This condition is gratifying to treat with ice, ultrasound followed by strengthening and stretching to provide prompt resolution.

The knee featured heavily among the rugby injuries with ligament tears and strains and some meniscal lesions presenting at the Clinic as well as injuries from direct trauma. The tackle situation was the most likely source of these injuries, usually with some flexion and rotation of the knee, although a couple of the injuries were non contact and a function of a failed side-step or tackle. This type of knee injury is fully discussed in the Football section. 15 rugby players presented with the inevitable inversion injury of the ankle.

Very few of the injuries presenting at the Tryst seemed to be caused by foul play. Scope for prevention of rugby injuries is less than in other sports as luck and trauma seem to play a more significant part in these injuries than in some other sports.

However, obedience to simple guidelines might well bring some benefit. Obviously the S.R.U. advice on concussion should be obeyed. There is the importance of suitable position in which to play, e.g. the first XV prop with neck problems might enjoy being the Third XV's blind side wing forward. If he is found to have more serious neck changes he should be advised to retire and perhaps become a Referee. Once again the importance of warm up and flexibility has to be stressed though in fairness to the Rugby Player, they seem to be better than the footballer in this respect. The other important aspect is adequate rehabilitation of thigh muscles after injury and of course, proper recovery from an ankle injury. Following these guidelines, rugby injuries could be reduced to that of mischance.

TABLE 14D INJURIES TO ATHLETES:

Athletics was the fourth commonest sport to present at the Tryst Clinic. Athletics was defined as field events and all track events up to 5,000 metres. Reflecting the United Kingdom and Scotland's problems at national team level, there were very few field event athletes who presented at the Clinic. One reinstated amateur from the Highland Games circuit and two Pentathletes were the only field event attenders. Attendance was mostly by sprinters and hurdlers.

Although members of many Clubs attended, the main athletic clubs served by the Clinic were Colzium Amateur Athletic Club based in Kilsyth, Cumbernauld Amateur Athletic Club and Kirkintilloch Olympian Amateur Athletic Club. All of these clubs are relatively new keen clubs beginning to gain promotion in their various leagues.

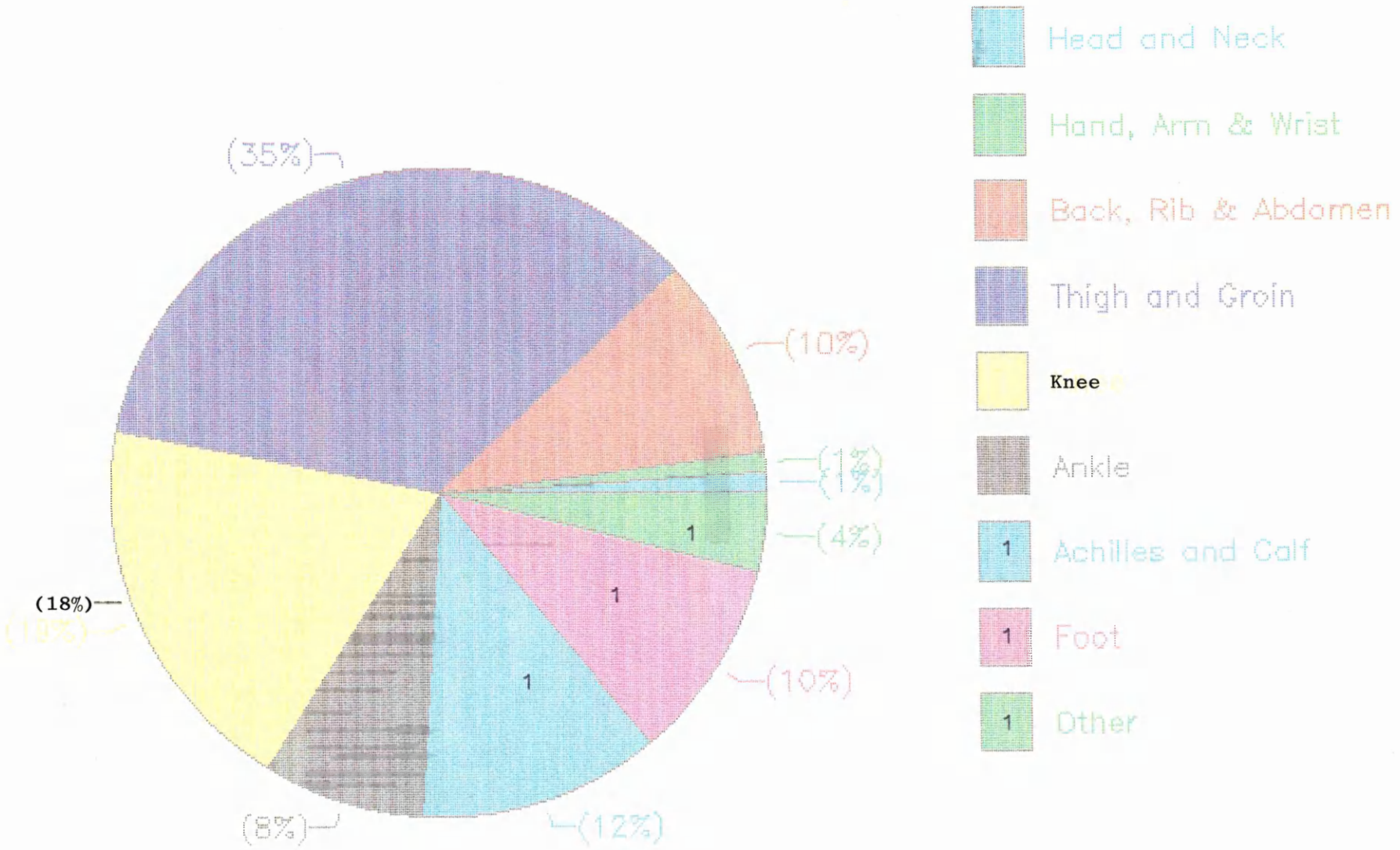
Injuries presented were varied and represented the spectrum of sporting injuries. Common injuries were back strain and sacro iliac problems, the ubiquitious ankle inversion injury (q.v.) foot trauma, some compartment syndromes and patello femoral dysfunction, particularly amongst the cross country youngsters.

However, dominating the analysis of the athletic injuries with 23 out of 98, (25%) was the strain or tear of the hamstring muscles. Frequent causes of hamstring tear or strain were inadequate flexibility, inadequate warm ups, inadequate facilities and technique problems. If these could be reduced then the number of hamstring injuries could markedly decline. The sprinters frequently seem to injure the middle third whereas the hurdlers injuries were closer to the muscle origin often with marked tenderness on the ischial tuberosity. Biceps tendonitis was also noticed in the sprinters. The lesions involving the origin at the /

TABLE 14D ATHLETICS

NECK		1
HAND AND ARM		1
CHEST AND ABDOMEN		4
BACK		6
HIP		1
THIGH		
Adductor Tear/Strain	6	
Hamstring Tear/Strain	23	
Quadriceps Tear/Strain	4	33
KNEE		
Infra. Pat. Tendonitis	1	
Med. Lig. Tear/Strain	2	
Pat. Fem. Dysfunction	8	
Popliteal Tear/Strain	3	
Osgood Schlatter	4	18
CALF AND SHIN		
Shin Splints	4	
Lat. Cmp. Syndrome	1	
Calf Tear/Strain	1	6
ANKLE AND ACHILLES		
Achilles Tendonitis	6	
Chronic Ankle Ligament	5	
Inv. Inj. Ankle	3	14
FOOT		
Ligament Strain	2	
Arch problems	3	
Metatarsal problems	2	
Trauma	3	10
OTHERS		4
		98

TABLE 14D
ATHLETICS



/the bone are by far the most difficult to treat. Standard treatment was first aid of rest, ice, compression and elevation. Physiotherapy modalities used included ultrasound and transcutaneous nerve stimulation. The mainstay of treatment is, however, stretching and later strengthening. Stretching begins as soon as possible unless there is a major tear. The preferred stretch was of a standing type, one leg standing, the other stretched forward onto a table or similar object, and bending the head down towards the stretched leg. Sometimes it has to be accepted that sitting or standing stretches are all that is possible although the preference would be for the previously described method. This type of stretching should be continued for the rest of the athlete's sporting life, prior to exercise and if at all possible, after exercise. Isometric exercises using resistance were used initially but improvement of the strength of the hamstring using a pulley system in the conditioning gym was the method of increasing strength. Subsequent return to sport should be by jogging and gentle stretching before full out sprinting. Two stubborn conditions were referred for orthopaedic opinion via General Practitioner, one being a tear at the muscle origin and the other a persisting tendonitis at the insertion of the hamstring.

King (24) in his book states that "there is no such thing as a chronic hamstring strain, it is an inadequately treated strain". This treatment is essentially correct but does not make allowances for the fallibility of the human being. There were at least two "chronic hamstrings" presenting at the Tryst simply because the patient had failed to learn preventative lessons.

Another finding at the Tryst which has been documented in some sport injury books (25) and (32) is the confusion between sciatica and a hamstring strain. The patient often suspects a hamstring /

/hamstring strain which in reality is sciatica. The clues are in the history and in the examination of the back. Sometimes both conditions can co-exist with the possibility that the back problems may lead to the hamstring strain or tear. Thus by aiming treatment at both aspects of this problem, the "chronic hamstring" may be helped. Muckle (45) although discussing essentially footballers hamstring, offers five suggestions why such injuries should recur. He suggests that they may be a result of lumbar spine abnormalities, meniscal problems at the knee, adherence of the lateral popliteal nerve, abnormal quadriceps power and enthesopathies, e.g. gout or other sero-negative spondoarthritides. At the Tryst, lumbar problems and reduced quadriceps power has been recorded as being relevant to these injuries.

Thus, in considering hamstring injuries in athletes, it is certainly true to state that prevention is infinitely preferable to treatment and is certainly attainable with a little foresight. The other injuries of the athlete have been or will be discussed within the differing sports in which they occur.

TABLE 14E BADMINTON:

64 Badminton injuries were treated at the Tryst. There are two or three Badminton courts in regular daily usage and a thriving local Badminton League.

The only obvious pattern was an increased incidence of back problems, particularly when contrasted with Squash. There was no head trauma in this series, although there was some to the hands. There were less shoulder problems than in Squash.

Tennis elbow featured strongly and was not so obviously related to racquet problems as in the Squash player. Treatment included ice, massage, ultrasound, transcutaneous nerve stimulation, strapping by the Physiotherapist. Steroid injections were also used with success but not inevitably so. These injuries have been noticed elsewhere in Badminton players before and it is believed to be a function of the stroke technique. When there is a disappointing response to standard therapy for tennis elbow, it is worth considering that there may well be an element of cervical nerve pressure mimicking tennis elbow.

The back problems which occurred in one quarter of all the Badminton injuries seemed to be a function of returning the shuttle after it had passed over a player's head. The movement involves a change of spinal flexion into extension with simultaneous torsion movements of the upper body. The Trust study contrasts with a major American study (52) which showed little or no back injuries. The United States study however involved a higher class of player than the local players in Cumbernauld and Kilsyth. Also, the Scottish players tended to be older than the players featured in the American study.

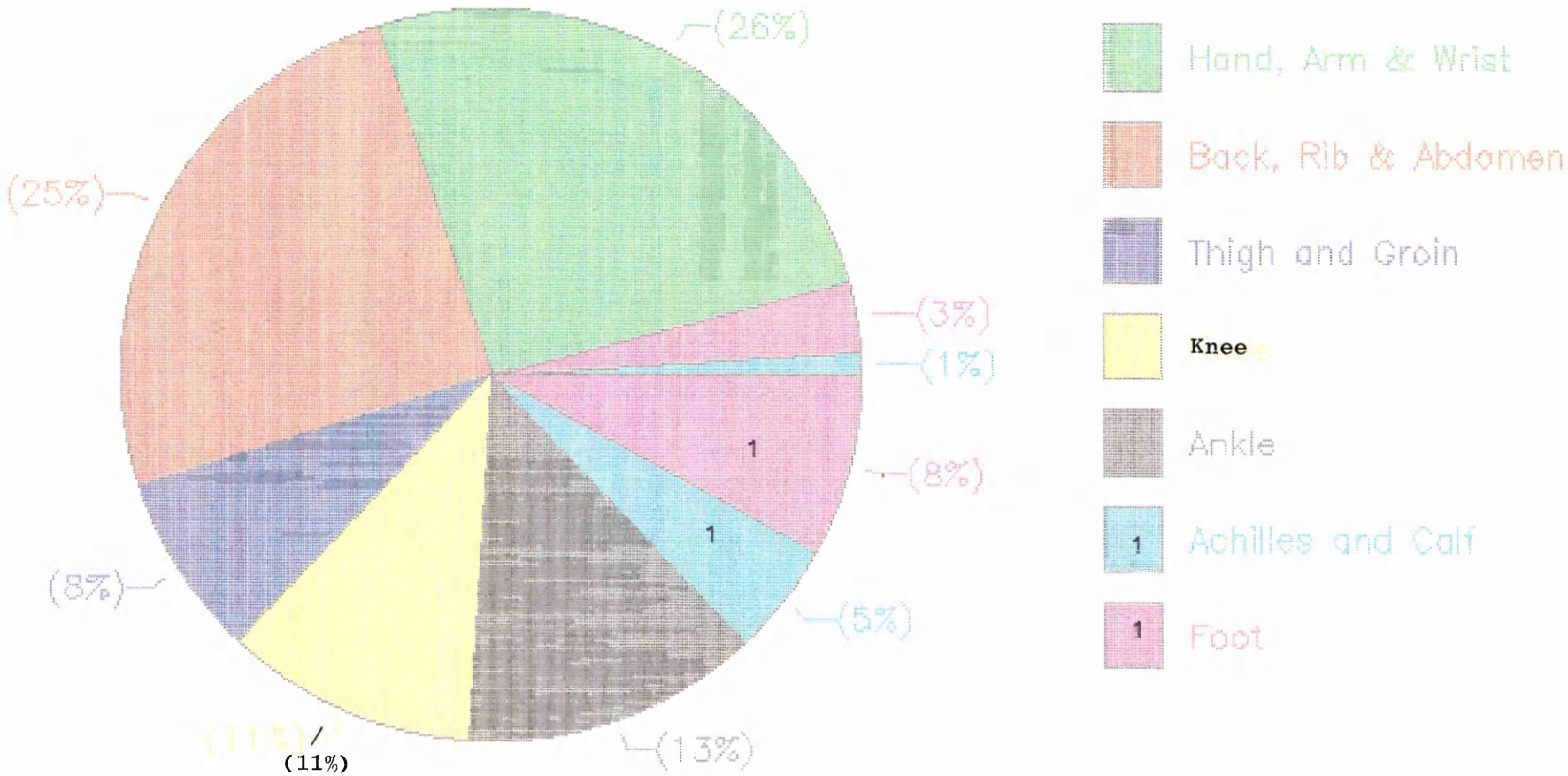
The lower limb injuries were similar in both Scotland and the United States with the ubiquitious ankle injury featuring in /

TABLE 14E INJURIES TO BADMINTON PLAYERS

NECK		1
SHOULDER		2
ARM		
Golfer's Elbow	1	
Tennis Elbow	5	
Trauma (Arm)	2	
Wrist problems	3	
Tenosynovitis	1	
Trauma (Hand)	5	17
BACK		
Muscle Strain	2	
Disc Lesion	5	
S.I. Strain	6	
Sciatica	3	16
THIGH		
Adductor Strain	2	
Hamstring Tear/Strain	3	5
KNEE		
Medial Ligament Strain/Tear	2	
Lat. Lig. Strain/Tear	1	
Pat. Fem. Dysfunction	2	
Osgood Schlatter	2	7
CALF		
Strain/Tear	2	2
ANKLE AND ACHILLES		
Achilles Tendonitis	1	
Inversion injury of ankle	7	
Lateral Ligament strain	1	9
FOOT		
Trauma	2	
Ligament Strain	3	5
		64

TABLE 14E

INJURIES TO BADMINTON PLAYERS



/in 7 players in the Tryst series. The American authors conclude that Badminton appears to be a relatively safe form of exercise with only slight injuries. The Tryst study would agree in general but with a slight proviso regarding the back injuries.

TABLE 14F SWIMMING:

54 swimmers presented with injuries. A frequent recommendation to the injured sportsman is to advise him to go swimming as a means of maintaining some aerobic fitness while a limb injury prevents participation in their own sport. It is therefore ironic to realise that the sixth most common sport for injury in the Tryst series was swimming. There is a possible explanation of this paradox.

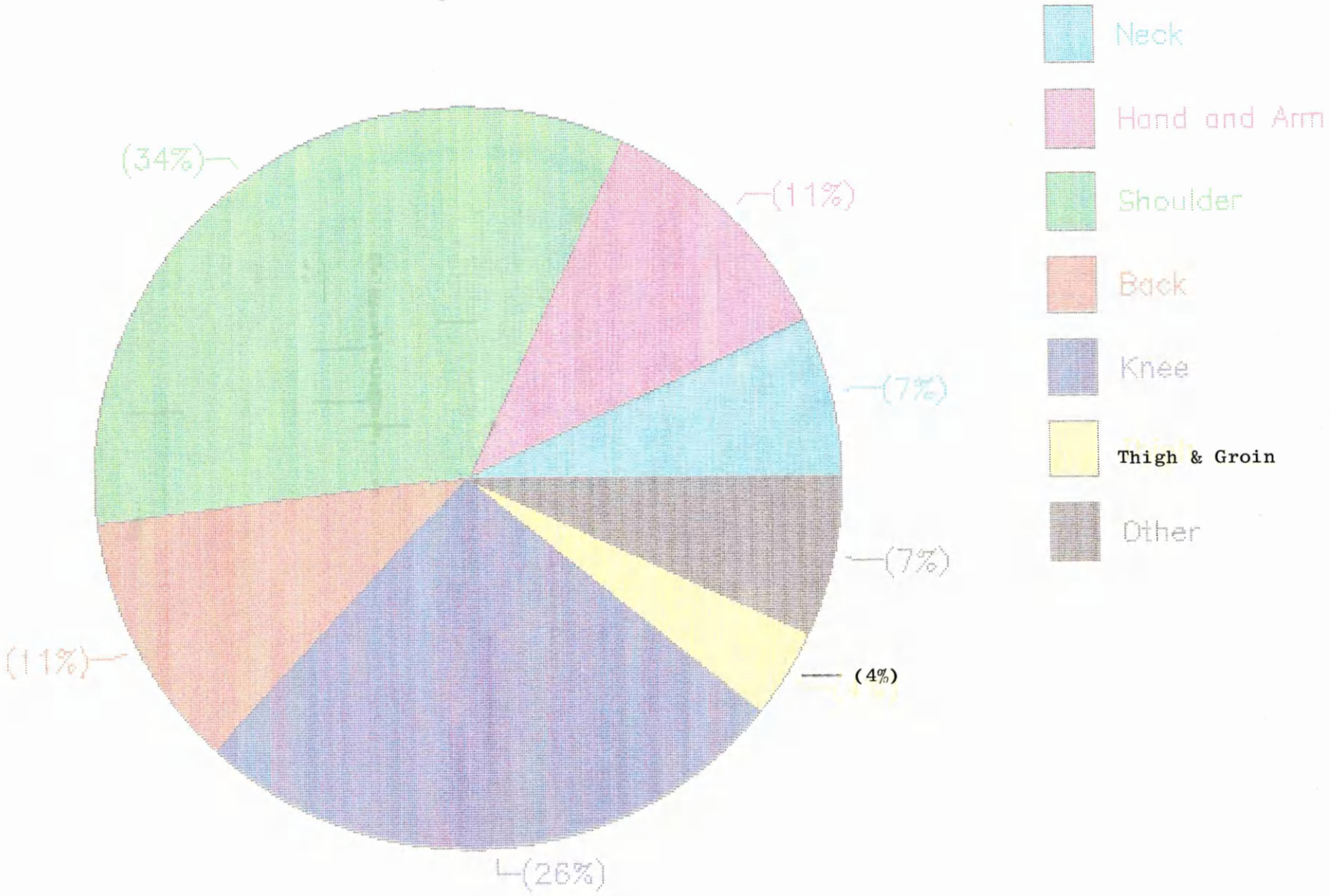
Some of the injuries were in recreational swimmers injured away from the Swimming Pool in other activities, including one swimmer who strained his back while lifting his child into the Pool. Three other injuries also occurred to active serious swimmers but occurred while they were participating in other sports.

Cumbernauld Swimming Club is one of the largest and best in Scotland with many youngsters having training sessions totalling 50,000 metres per week. Patterns of injury therefore emerge. Reilly and Miles in writing in "Sports Fitness and Sports Injuries" (26) stated that 64% of the Clubs in the North of England reported no injuries to their swimmers in a year. This study was performed in 1975 and is in contrast with the pattern at Cumbernauld. However, Mahoney, Purdam and Fricker (53) report that 15% of competitive Canadian swimmers had a significant shoulder problem. They also state that in a different study of Canada's top 137 Swimmers, 58 of them reported symptoms of Swimmer's Shoulder. The shoulder, neck and arm represented 51% of all swimming injuries seen in the Tryst series. Trapezius strain seems to be associated with breast stroke and other neck lesions involved postural problems leading to cervical neck pressure. The mechanism of the commonest injury seems to be an impingement involving the supraspinatus tendon. There is a further /

TABLE 14F INJURIES TO SWIMMERS

NECK		4
HAND AND ARM		6
SHOULDER		
Supraspinatus Tear/Strain/Tendonitis	13	
Capsulitis	4	
Deltoid Strain	1	18
BACK		
Muscle Strain	4	
Sciatica	1	
Disc Lesion	1	6
KNEE		
Medial Ligament Strain/Tear	4	
Pat. Fem. Dysfunction	3	
Osgood Schlatters Disease	3	
Infrapatellar Tendonitis	2	
Trauma	2	14
THIGH		
Quadriceps Tear	1	
Hamstring Strain	1	2
OTHER		4
		54

TABLE 14F
Injuries to Swimmers



/further type of supraspinatus problem that involves a direct strain in the muscle body itself. A third condition around the shoulder seems to be a generalised inflammatory process of the joint with possible capsulitis. Problems were also recorded in the wrist and flexor muscles in the forearm. With one exception, possibly related to trauma other than swimming, most of the "Swimmers Shoulder" responded to ice, ultrasound and transcutaneous nerve stimulation with relative rest, i.e. kick only or using a float as a temporary measure. Discussion with the Swimming Club Coach regarding technique involving entry and pull through of stroke was very helpful. Steroid was rarely used other than on two occasions close to Commonwealth Games Selection time. The Cumbernauld Club have an excellent warm-up programme which perhaps keeps their injuries down below the Canadian studies level.

The back also caused some slight problems in serious swimmers but none were of a serious nature.

The knee was also involved through trauma with such as medial ligament strain, Osgood Schlatters and two young breast stroke swimmers with patello femoral dysfunction. The other patello femoral dysfunction was a freestyle swimmer who had added five mile runs to his training schedule when the pool was closed for refurbishment.

Thus, apart from the serious level of swimmer with large yardage in which arm overuse injuries predominate, swimming can generally be regarded as being reasonably safe as a sporting activity.

TABLE 14G SQUASH:

49 Squash players sought attention at the Clinic. There are six Squash Courts at the Tryst, the Tryst Squash Club having eight teams in the various West of Scotland and Central Region Leagues, with the top team in the First Division.

There was no single dominant injury but some of the injuries seemed to reflect some typical Squash injury patterns. One of the head injuries in the Table was in fact an eyebrow laceration from an opponent's racquet. This occurred while the Clinic was in operation and the lesion was duly sutured. It is well known that head and eye injuries are as a result of the confined space of a Squash Court.

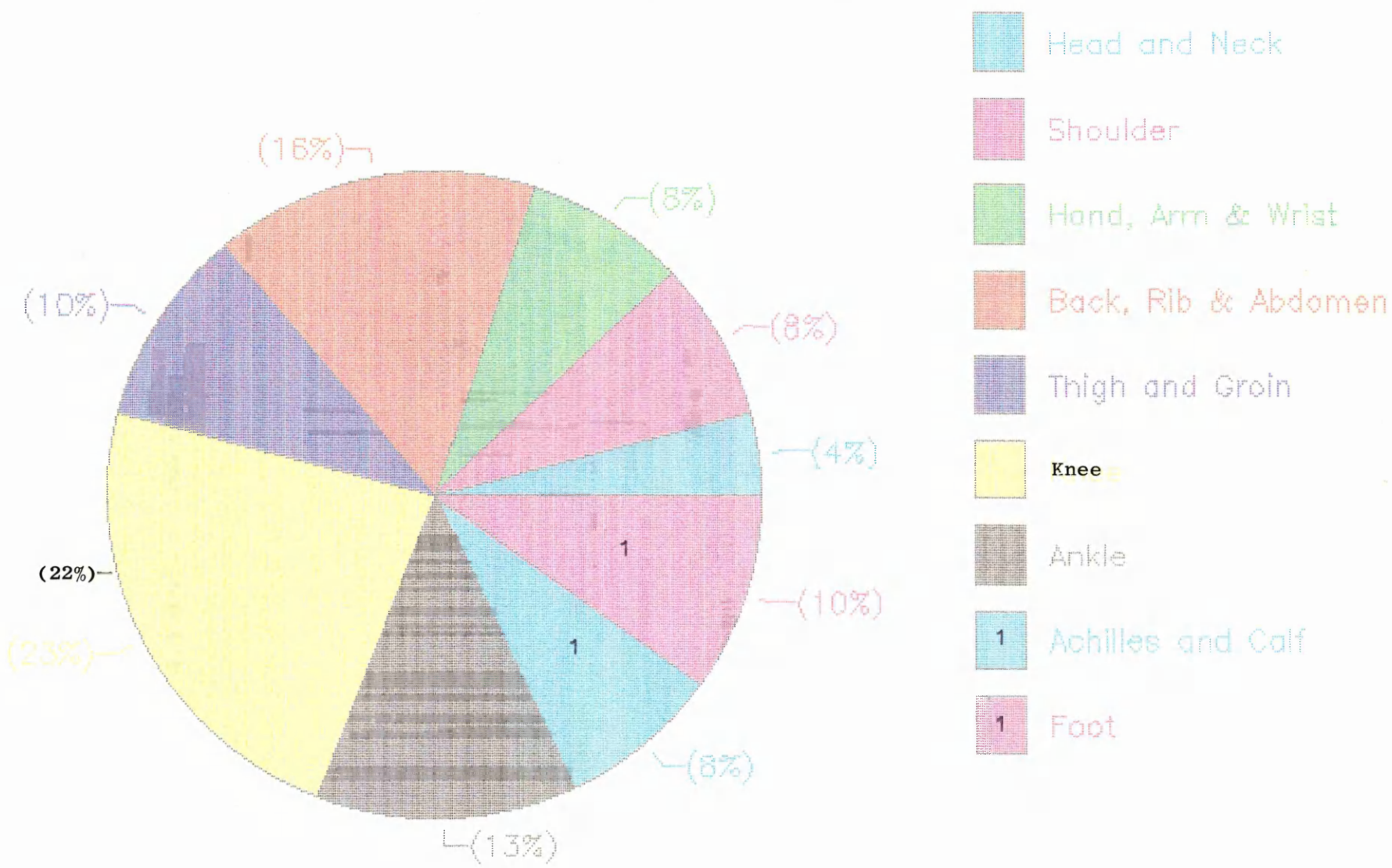
The leverage forces involved in the sport produced shoulder injuries such as rotator cuff type syndromes with the possibility that there is a function of impingement (q.v. Swimmer's Shoulder). Tennis elbow also occurred in one case due to a change of racquet to that with a smaller handle. Back injuries were also recorded though not as frequently as in Badminton, possibly because the overhead shot is less common in Squash than it is in Badminton. The twisting and turning and change of direction of Squash was responsible for some of the medial ligament strains of the knee. This condition is covered in the Football section (q.v.). Some calf strains and the inevitable ankle ligament problems occurred as well as injuries of the foot.

Important factors in prevention of injuries in Squash include adequate warm-up, appropriate flexibility. Technique is of crucial importance as is attention to racquet and shoes.

TABLE 14G INJURIES TO SQUASH PLAYERS

HEAD		2
SHOULDER		4
ARM		4
CHEST/ABDOMEN		4
BACK		5
THIGH		
Hamstring Strain/Tear	3	
Quadriceps Strain/Tear	1	
Adductor Strain/Tear	1	5
KNEE		
Medial Ligament Strain/Tear	7	
Lateral Ligament Strain/Tear	1	
Pat. Fem. Dysfunction	3	11
CALF		
Strain/Tear		3
SHIN		1
ANKLE		
Ligament Strain/Tear	6	6
FOOT		5
		49

TABLE 14G
INJURIES TO SQUASH PLAYERS



ORTHOPAEDIC REFERRAL VIA GENERAL PRACTITIONER:

Although the Clinic was essentially a primary care institution there were inevitable overlaps with secondary care. Orthopaedic referral resulted from inappropriate presentation at the Clinic or where the primary care at the Tryst had failed. All referrals to the Orthopaedic Surgeons were by recommendation in a letter to the patient's General Practitioner. Inevitably the knee was the most common anatomical area which required referral - meniscal or serious ligament damage usually being the reason. The back was the other significant region for which referral was made.

Reflecting the fact that the knee was the most damaged area, it is not surprising to find that football and rugby are the most common sports for which referral was necessary and, to a lesser extent, running ski-ing and badminton. The total numbers represented only 3% of the total. Although it is possible that many sportsmen sought orthopaedic advice subsequently or independently, this is still a very reassuring figure.

TABLE 15 ORTHOPAEDIC REFERRAL (via G.P.)

SITE OF INJURY		
Knee	31	
Back	7	
Foot	2	
Ankle	1	
Shoulder	1	
Others	3	
	45	(3% of all injuries)

SPORT	
Football	12
Rugby	7
Running	7
Ski-ing	3
Badminton	3
Swimming	2
Athletics	2
Canoeing	1
Hockey	1
Wrestling	1
Aerobics	1
Martial Arts	1
Squash	1
Golf	1
Gymnastics	1
Dance	1
	45

TABLE 15 – ORTHOPAEDIC REFERRAL

SITE OF INJURY

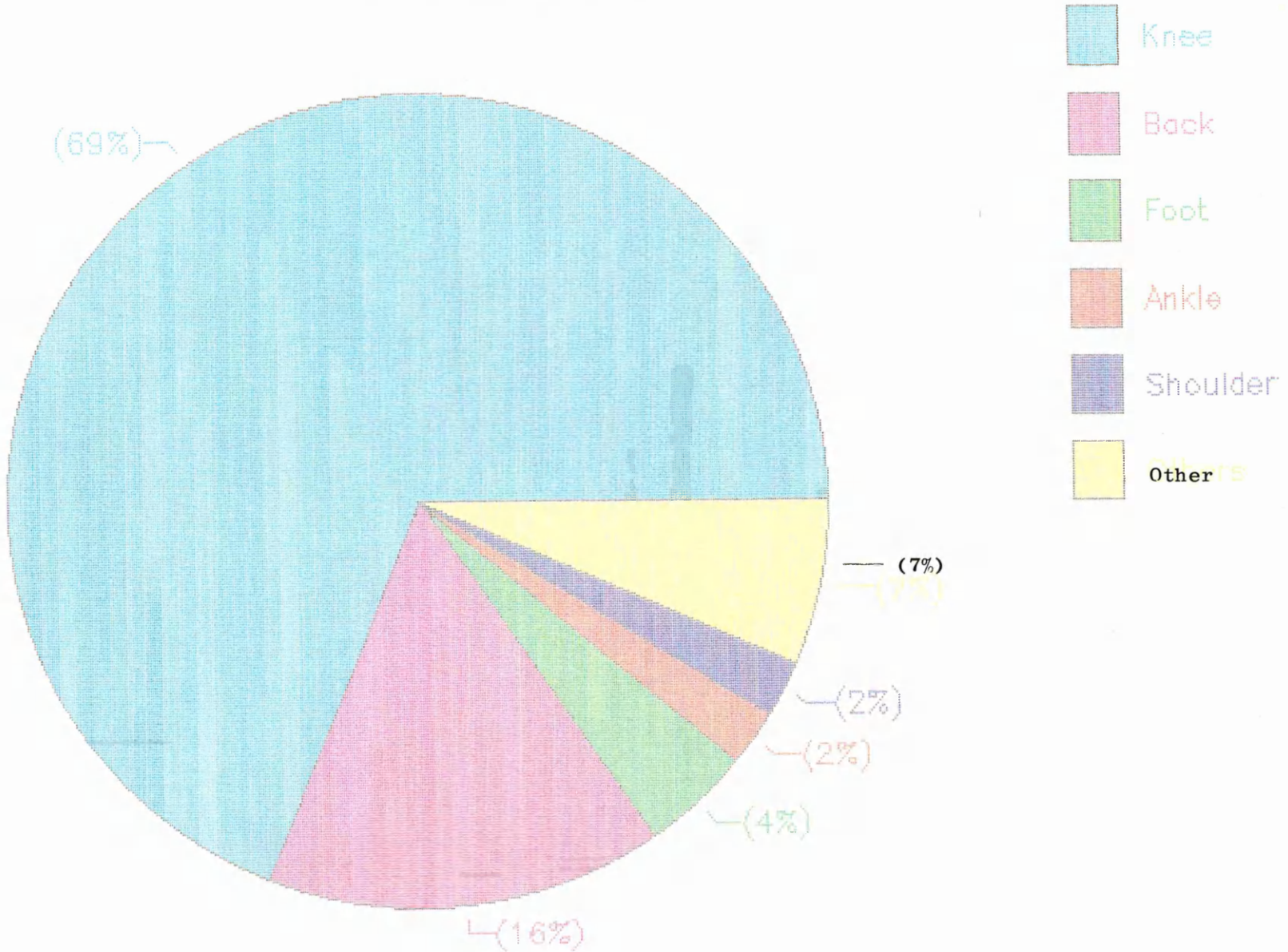
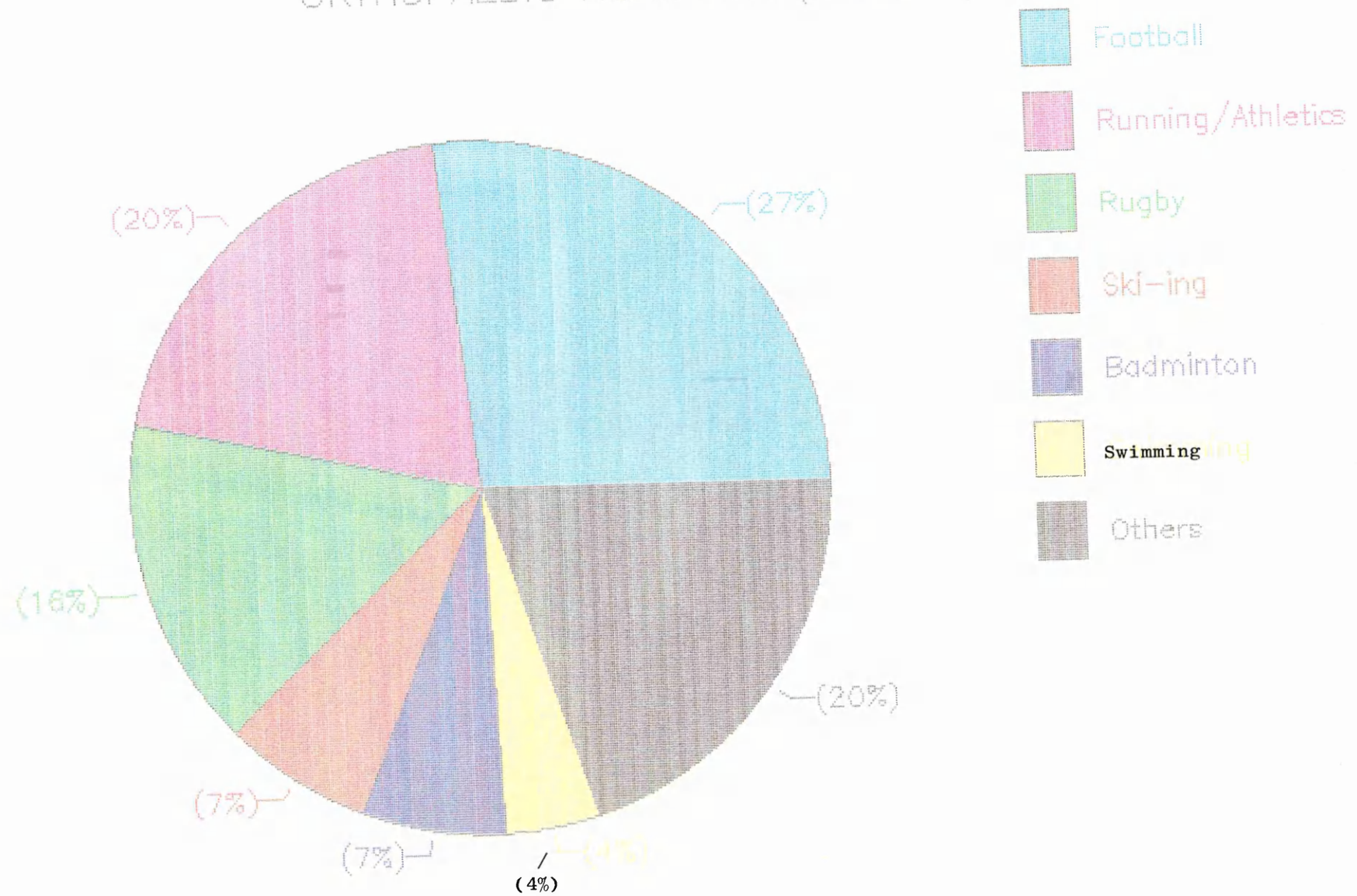


TABLE 15 – ORTHOPAEDIC REFERRAL

ORTHOPAEDIC REFERRAL (via G.P.)



COMPARISON OF INJURY PATTERNS IN DIFFERENT SPORTS:

Table 16: Graphical representation

Table 17: Numerical comparisons.

Different sports demonstrate different patterns of injuries such as runners mainly having a lower limb problem compared with swimmers having an upper limb pattern. Therefore, when analysing the injury pattern of each individual sport, the Tables 14(A) to 14(F) were based on the pattern of injury in each individual sport.

Comparison between the differing sports might be of value. The first Table, Table 16, shows in graphical form Tables 14(B) to 14(G) with the various injured parts of the body as a percentage of the total injuries in each individual sport. At this simple level the shoulder stands out in the swimming column compared with other sports as does the back problem in badminton. Another marked feature is the thigh and groin column in athletics, representing the hamstring strain and tear which is common in this sport.

This simple approach was of some value but in order to give scientific validity a system was sought to apply statistical tests. Data for each sport was reviewed and divided into section and sub-section of the differing parts of the body which would allow precise comparison - Table 17. The data were computerised and the contingency table, expected values, standardised residuals, Chi-square, degrees of freedom are shown on Table 17(B) computer analysis. In order to give adequate numbers for valid statistical analysis, decisions were made to omit the head, neck, rib and back and medical conditions, categories that are shown in Table 17. It can be seen that 25 of the expected values are below 5 and the lowest is 1.7, all others are at least 2; this would suggest that no further omissions are required. The observed significant values are robust enough to support the clinical impression that the occurrence of injuries is not randomly distributed amongst the sports.

Analysis of the standard residuals allows comment on the risk of injury in each sport - in all of these aspects standard residuals were greater than 3 either positively or negatively.

The major positive associations contributing to the highly significant differences observed from that expected on the null hypothesis are those of shoulder complaints amongst swimmers, arm and back problems amongst badminton players, Achilles tendon and calf trouble in runners, ankle injuries in footballers, shoulder injuries in rugby players, groin and thigh in athletes.

The Table shows that there is no real positive contribution from any other source to a significant level.

The negative findings of importance seem to be the absence of upper limb complaints in runners, perhaps, surprisingly, the lack of Achilles tendon and calf complaints in footballers. These deficiencies were less powerful influences in analysis than the positive associations above.

Thus, in summary, statistical tests show that certain injuries have a greater likelihood of occurring in certain sports and this was not always able to be predicted by the Medical Officer.

TABLE 16

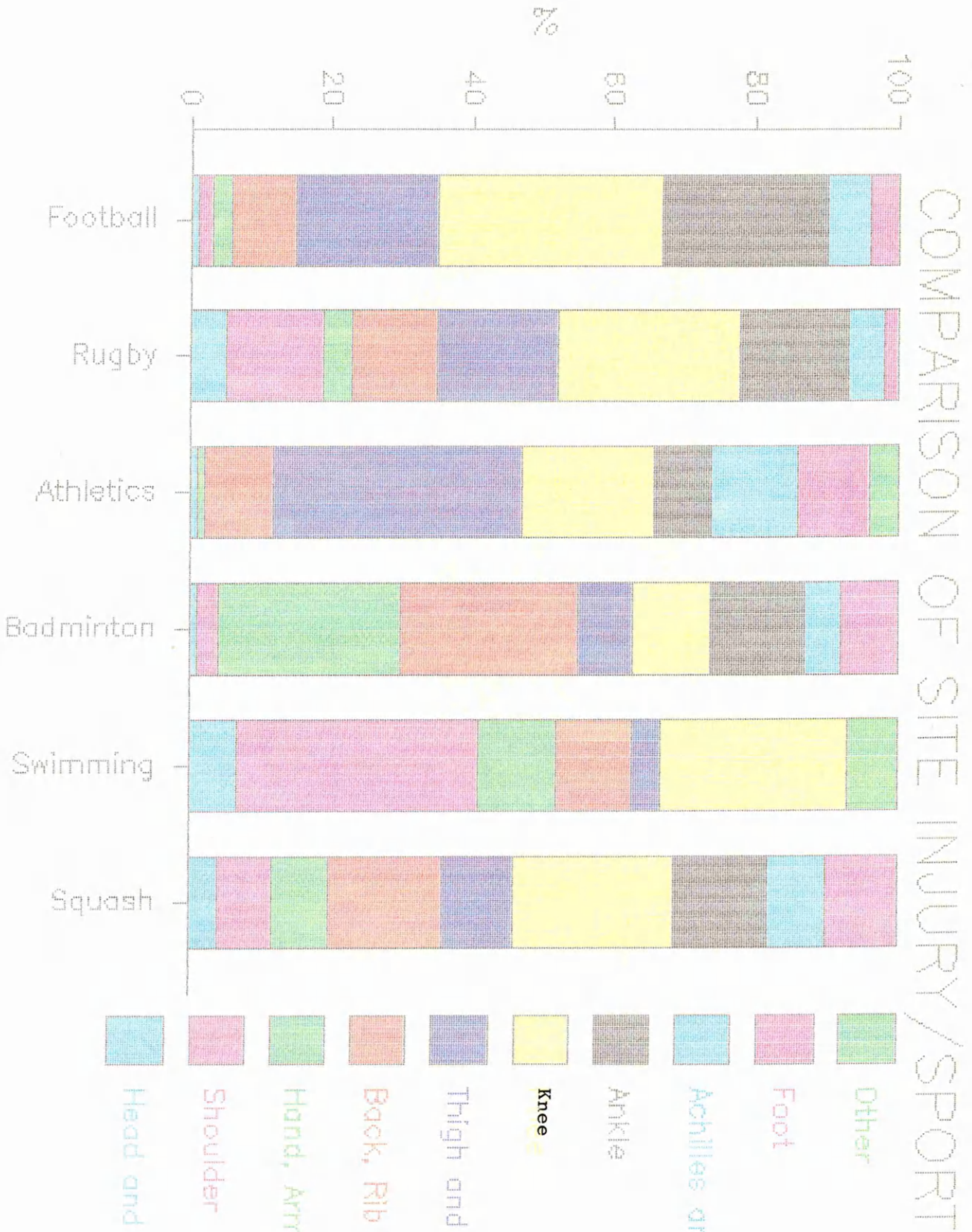

%
0
20
40
60
80
100
Football
Rugby
Athletics
Badminton
Swimming
Squash
COMPARISON OF SITE INJURY / SPORT
Head and Neck
Shoulder
Hand, Arm & Wrist
Back, Rib & Abdomen
Thigh and Groin
Knee
Ankle
Achilles and Calf
Foot
Other

TABLE 17. COMPARISON OF SITE OF INJURY/SPORT.

SITE OF INJURY	SPORT RUN	FOOTB	RUGBY	ATH	BADM	SWIM	SQUASH
HEAD	0	0	2	0	0	0	2
NECK	3	2	4	1	1	4	0
1 SHOULDER	4	8	17	0	2	18	4
Overuse	2	2	0	0	2	18	3
Trauma	2	6	17	0	0	0	1
2 REST OF ARM	0	9	5	1	17	6	4
Overuse	0	1	0	1	10	3	2
Trauma	0	8	5	0	7	3	2
3 BACK	24	25	12	6	16	6	5
RIB	0	3	3	2	0	0	0
4 GROIN AND THIGH	78	61	20	33	5	2	5
Add.Strain/Tear	9	20	3	6	3	0	1
Quads.Haematoma	0	6	8	0	0	0	0
Quad.Strain/Tear	0	13	2	4	0	1	1
Hams.Strain/Tear	10	18	6	23	2	1	3
I.T.Band Synd.	44	0	0	0	0	0	0
Other	15	4	1	0	0	0	0
5 KNEE	108	97	31	18	7	14	11
Pat. Fem.Dys	61	9	4	8	2	3	3
Osg.Schlat.	3	5	0	4	2	3	0
Med.Lig.Str/Tear	15	38	11	2	2	4	7
Lat.Lig.Str/Tear	0	6	7	0	1	0	1
Meniscus Lesion	0	9	3	0	0	0	0
Cruciate Damage	0	5	1	0	0	0	0
Other Trauma	0	12	4	0	0	2	0
Others	29	13	1	4	0	2	0
6 ANKLE	39	71	18	8	8	2	6
Acute Inv.Inj.	24	48	15	3	7	2	4
Chr.Lig.Problem	15	12	0	5	1	0	0
Trauma	0	6	0	0	0	0	2
Others	0	5	3	0	0	0	0
7 ACHILLES & CALF	86	19	6	12	3	1	4
Ach.Peit/Tend	22	9	3	6	1	0	0
Calf Strain/Tear	19	6	4	1	2	1	3
Overuse Syndrome	45	0	0	5	0	0	0
Trauma	0	4	0	0	0	0	1
8 FOOT	25	13	3	10	5	1	5
Ligament/Arch	19	3	0	5	3	0	2
Trauma	2	3	3	3	2	0	2
Others	4	7	0	0	0	1	1
MEDICAL CONDITIONS	7	0	0	2	0	0	0
OTHERS	18	0	0	5	0	4	3
TOTAL	392	308	121	98	64	54	49

BLE 17B. COMPARISON OF INJURY PATTERNS IN DIFFERENT SPORTS: (STATISTICAL ANALYSIS)

x 7 CONTINGENCY TABLE

TA:	1 RUNNING	2 FOOTBALL	3 RUGBY	4 ATHLETICS	5 BADMINTON	6 SWIMMING	7 SQUASH
SHOULDER	4	8	17	0	2	18	3
REST OF ARM	0	9	5	1	17	6	4
BACK	24	25	12	6	16	6	5
GROIN & THIGH	78	61	20	33	5	2	5
KNEE	108	97	31	18	7	14	11
ANKLE	39	71	18	8	8	2	6
ACHILLES & CALF	86	19	6	12	3	1	4
FOOT	25	13	3	10	5	1	5

PECTED VALUES	RUNNING	FOOTBALL	RUGBY	ATHLETICS	BADMINTON	SWIMMING	SQUASH
SHOULDER	18.5	15.4	5.7	4.5	3.2	2.5	2.2
REST OF ARM	14.9	12.4	4.6	3.6	2.6	2.0	1.8
BACK	33.4	27.8	10.3	8.1	5.8	4.6	4.0
GROIN & THIGH	72.6	60.4	22.3	17.5	12.6	10.0	8.6
KNEE	101.7	84.7	31.3	24.6	17.6	14.0	12.0
ANKLE	54.1	45.0	16.6	13.1	9.4	7.4	6.4
ACHILLES & CALF	46.6	28.8	14.3	11.3	8.1	6.4	5.5
FOOT	22.1	18.4	6.8	5.3	3.8	3.0	2.6

NDARDISED IDUALS	RUNNING	FOOTBALL	RUGBY	ATHLETICS	BADMINTON	SWIMMING	SQUASH
HOULDER	-4.31	-2.31	5.15	-2.27	-0.71	10.21	0.58
EST OF ARM	-4.92	-1.19	0.20	-1.47	9.45	2.88	1.75
ACK	-2.14	-0.67	0.59	-0.81	4.60	0.71	0.57
ROIN & THIGH	0.88	0.10	-0.58	4.31	-2.46	-2.89	-1.39
NEE	0.91	1.88	-0.07	-1.64	-3.08	0.01	-0.35
NKLE	-2.77	5.00	0.38	-1.59	-0.50	-2.21	-0.17
CHILLES & CALF	7.70	-4.06	-2.50	0.24	-1.97	-2.34	-0.70
OOT	0.80	-1.54	-1.59	2.18	0.64	-1.23	1.56

**2..... = 398.78
rees of Freedom..... = 42
P is less than 0.0001.

CLINICAL CURIO:

While many of the minor sports did not produce enough injuries to justify individual analysis, some of the injuries obtained in them are worthy of some comment.

Anterior compartment syndrome occurred quite severely in a young champion trampolinist, perhaps a function of her hours of practice, all basically on her toes. Similarly it occurred in a good young gymnast and also a keen young handballer, both of these were young females. Treatment was on the previously described method for runners.

Majorettes and baton twirling, two entities as distinct as Rugby Union and Rugby League to their participants, produced adductor, hamstring and calf strains. Interestingly, hill walkers can suffer from "Runners Knee" for very similar biomechanical reasons. Bowls players suffer from tennis elbow, perhaps as a function of technique in the way in which they hold the bowl.

Three American footballers presented for treatment at the Tryst as this sport gained in popularity. One was a player who aspired to be a linebacker but in reality his long neck was not appropriate to this position, and interestingly he had come to the same conclusion before attending the Tryst. The wide running stance demanded by the American Football coaches to make it more difficult for the player to be knocked down, produced an adductor strain in one young ex soccer player meeting this type of running for the first time. The third injury was inevitably, the inversion injury of the ankle.

Two slightly whimsical syndromes have been noticed at the Tryst. Firstly, the "Kevin Keegan Syndrome" named after the English Soccer Captain of the 1982 World Cup in Spain, who sought advice from an Orthopaedic Surgeon, a Chiropractor and Osteopath, in two cities in /

/in 48 hours, in a vain attempt to get his back fit to play. This syndrome involves a class performer at International or close to International level who is hawking himself round every available medical opinion in search of one who agrees with his own diagnosis in a forlorn hope that there can be a cure for a condition which in reality is not going to be treatable in time for their event. A few of these presented at the Tryst and they are exceptionally difficult to treat because the chances of compliance with suggestions will be remote.

"Walker's Syndrome", named after the Medical Officer, who not only is the first Doctor to describe this syndrome, but also one of the first sportsmen to suffer from it. Walker's Syndrome is "Beware of the Arrogance of the Competent Sportsman at another Sport who turns to running". This syndrome has been observed in rugby players, footballers, hockey players and a life guard. As the sportsman is "fit" for his own sport, he ignores the guidelines and advice given to novice runners. He, (it is an exclusively male condition) soon acquires an overuse injury, often related to the very biomechanical abnormality which might be an asset in his original sport, e.g. tibia vara in a soccer player. He continues in his "macho" manner to run through this injury until it is totally impossible to run. He then seeks help, very disgruntedly. Fortunately, explanation is usually sheepishly curative.

Fortunately most sportsmen and sportswomen are pleasant, if slightly intense individuals and are grateful for a sympathetic ear.

MEA CULPA:

Any Doctor who is analysing his work is duty bound to confess errors in an effort to prevent others repeating them. Cervical spondylosis and tennis elbow co-existing and hamstring and sciatica causing confusion, were errors noticed at the Tryst, particularly in the beginning. As the pattern recognition that is important in all branches of medicine develops, this danger becomes less. A diagnosis of patello femoral dysfunction in an adolescent female runner was found by an Orthopaedic Surgeon, with the benefit of x-ray to be Osteochondritis Dissecans.

A tendency to be slow in advising x-ray in adolescents with back or pelvic problems, even including hamstring origin problems, has now been rectified. Advice would be that if a condition does not appear to be simple or does not respond very quickly, then x-ray is well worth recommending as there are often fundamental underlying problems.

A diagnosis in a distance runner of a persisting viral infection, based on the history and a pulse of 84 per minute, were later, according to the "athletics grapevine", found to be due to an overactive thyroid gland.

Fortunately with a consultation system as opposed to the list system of general practice, failure is not always present as a constant reminder. Hopefully in balance the correction of wrong diagnoses made elsewhere by the Tryst might outweigh any of the errors at the Tryst.

CONCLUSION:

After five years of operation and 1,417 patient attendances, there are conclusions which can be drawn. These fall into three categories: Firstly, future research related to the hypotheses discussed previously, namely, ankle inversion injuries, flexibility and injury prevention in footballers, patello femoral dysfunction in female athletes and the role of orthoses. Secondly, implications at local level for sports training and practice and also to "grass roots" medical practice. Finally, the work of the Tryst and other similar centres poses questions that involve medical education in all its aspects. The future development of Sports Medicine and Sports Injuries Centres should lead to further research and development in these fields.

FUTURE STUDIES:

As a result of this report, there are four possible future studies which are being considered by the Medical Officer and the Management Committee.

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A prospective trial of different treatments of ankle ligament injuries is proposed. As discussed in the Section on Inversion Injuries of the Ankle and Injuries to Footballers, this condition represented 10% of the injuries presenting at the Tryst. Many of these patients had attended Accident and Emergency Departments previous to coming to the Tryst and were unhappy with the progress of their injury. The Medical Officer firmly believes that a programme of exercises is important for ankle rehabilitation. Brooks (30) conducted a trial of four different treatments for these ankle ligament conditions and concluded that mobilisation with physiotherapy is the most satisfactory course of treatment.

The Medical Officer's suggested trial would be based at an Accident and Emergency Deparment. The full protocol is outlined in Appendix 3. The study would involve 300 patients with ankle inversion injuries with no fracture. Age limit would be 18 - 65 years.

One group would receive support bandaging in the form of Tubigrip and simple advice from the Casualty Officer. This represents current practice. The second group would be referred within 48 - 72 hours of attending the Accident and Emergency Department to a Physiotherapy Department. The third group would receive a simple exercise sheet as outlined in Appendix 2.

The patients would be assessed on two primary factors - 1. pain using an analogue scale, and 2. on ability to run round a figure of eight. Secondary factors measured would include swelling and hopping ability. The trial would test if physiotherapy or unsupervised exercise has anything to offer patients compared with current non-active treatment. It would also allow comparison of an advice sheet with full physiotherapy supervision. An Accident and Emergency is currently being sought to participate in this trial.

.....

A trial to measure the effectiveness of a planned regular stretching programme (Appendix 4) before training and playing on the numbers of hamstring, adductor strains and tears in amateur football teams. The hamstring, quadriceps and adductor injuries which frequently occur in football, represented a sixth of all football injuries presenting at the Tryst. The Medical Officer has been convinced that inadequate flexibility is a major factor in this and that adequate stretching would help to reduce the number of injuries. An approach has been made to two Clubs in the Premier and First Divisions of the Stirlingshire Amateur League to record the number of hamstring, adductor, quadriceps tears and strains during a season. Also to note the number of games and training sessions missed /

/missed by a player because of these injuries. One Club will be offered the stretching programme recommended by the Medical Officer for training and matches (Appendix 4). There will be no other changes in training or any other interference. Analysis will be made at the end of the Season and comparison between the injuries received and time lost by each Club will be made.

The role of Coach or Team Manager will be crucial to the success of this study and they will be fully briefed on the injury. The Tryst will see most of these injuries but some will attend elsewhere. Thus, the recording of injuries by the Coach or Trainer will be important to this study. The Medical Officer's hypothesis will be put to the test.

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A similar project aimed at Athletic Clubs, particularly those concerned with adolescent female runners, will be attempted with regards to Patello Femoral Dysfunction.

The Medical Officer believes that the role of the vastus medialis muscle strength is important in preventing and treating this condition. There are many other factors involved with this condition but the Medical Officer is convinced that vastus medialis strengthening is the most important. This muscle is frequently poorly developed in adolescent female runners and athletes.

Two Clubs (or two parts of a Club) would be approached. One Club to continue with their normal training in all its usual aspects. The other Club concerned with similar training - as a result of the formal Coach education system in Scottish Athletics, there is a considerable degree of similarity in the training systems of various Clubs at a given stage in an athlete's development. The second Club will have the addition of specific muscle exercises to develop and maintain the vastus medialis, i.e. straighten leg raising, toe curled, six inch lifts in external rotation. Since the Tryst sees almost all the runners in this category, a note will be made of those presenting with Patello Femoral Dysfunction over two seasons, hopefully /

/hopefully giving enough numbers to be of scientific validity.

.....

The fourth area for future research is the field of running injuries and those patients who were advised at the Tryst to seek Podiatrist advice. During the five years at the Tryst, 48 runners were referred for Podiatrist assessment. A postal survey (see Appendix 5) is proposed to learn how many of them were fitted with an orthotic; did the Podiatrist and/or the orthotic help the injury; is the athlete still wearing the orthotic and is the athlete still actively running? This, given an adequate response, will provide interesting comparisons with the study of Sperryn and Restyn (41) who found that only 50% of such athletes were wearing orthotics after three and a half years.

.....

These proposed projects would hopefully add some useful information to areas of clinical controversy and put the Medical Officer's clinical experience through a challenge of scientific validity. If they were to be found valid, he would then be in a position to influence the clinical practice of other Doctors and to add to the training of football and athletic Clubs in such a way as to reduce the number of injuries.

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RECOMMENDATIONS:

LOCAL

The pattern of injuries and presentation which has emerged at the Tryst has offered some conclusions that may be given to local athletes and Medical Practitioners.

The Clinic has justified its formation and existence in terms of number of patients seen. There were several local voices that doubted in the beginning whether such a Clinic would be valid. 400 sportsmen and sports-women have returned subsequently with a second differing injury and many recommend their friends and colleagues to attend the Clinic. This must indicate a need or demand is being met which is not being fulfilled /

/fulfilled elsewhere, despite a financial disincentive to attend such a Clinic. The attraction of the Clinic includes the ethos of the Clinic and that the patient's hopes will be understood, that he will not be dismissed with his ambition scorned or told to rest blindly. Empathy and enthusiasm are important aspects of any branch of medicine, but especially in relation to sport. The Clinic would like to think that these are being offered at the Tryst. The timing of the Clinic, in that it is in the evening and the generous allocation of time allocated to each patient are also important factors. The District Sports Council who operate and are responsible for the Clinic certainly think that it has been a success and have dispelled any doubt about the need for such an establishment. The advice the Clinic would offer would be to the various categories such as the sportsman, the Coach or the General Practitioner.

The sportsman must be knowledgeable about his sport. There are now several good books giving guidance on training for the Marathon or distance running and there is little excuse now for the basic errors that frequently occurred in starting a running programme. If the sportsman has the misfortune to be injured, advice should be sought earlier rather than later. An immense responsibility must rest with the Club Coach, whether qualified or merely an enthusiastic assistant. His knowledge must be even more precise that the athletes. In addition he may have the responsibility for the care of children - 16% of those presenting at the Tryst were under 16 years. The basics are crucial to the Coach - equipment, including shoes must be correct, the warm up fastidious, the training logical, the choice of position appropriate in a team game, the awareness of early signs of injury and the appropriate response to a signal of injury - all come within the scope of the Coach.

If the Coach or Club include fixed exercises as parts of its training, then time spent on strengthening the vastus medialis with straight leg raising would be of benefit as there will be a high proportion of sportsmen with Patello Femoral Dysfunction or previously damaged knee ligaments in the Club. If circuit training is an integral part of the Club's training method, then the possibility of a station on the circuit for a wobble board or similar type of exercises to improve proprioception, should be included as there is a high probability that within the Club there will be those with weak injured ankle ligaments who would benefit from this exercise.

All sportsmen should stretch regularly and fully before training or playing. This is especially important in sprinters, hurdlers, rugby players and most of all amateur football players, as they are all liable to pay a painful penalty for inadequate flexibility.

PROFESSIONAL

There are lessons for clinical practice for local Doctors although this only reflects problems on a national scale and the need for a greater degree of knowledge of Sports Medicine and Sports Injury within the medical profession.

For the Casualty Officer, while appreciating the severity of his workload, the suggestion that a supply of leaflets, say for ankle injuries and appropriate early referral to physiotherapy department will benefit his patient and not utilise too much of his valuable time.

To General Practitioners, the Clinic would plead for sympathy for patients who are sportsmen. Advice to give up exercise or sport must be given for logical and important reasons as the risks might be outweighed by possible gain in cardiac risk factors and even life expectancy if recent reports are proven to be accurate. A prescription of rest without qualification of type, nature and length of such rest is thoughtless, illogical and often inadequate unless the root cause is tackled. Usage of physiotherapists should be encouraged as physiotherapists are more knowledgeable than G.P.s and usually keen to help such injuries.

These lessons for the Sportsmen, Coach and Medical personnel have all a similar rationale- correction of a lack of knowledge of the physiology and pathology of exercise and sport.

GENERAL

As discussed in the introduction, there has been a major increase in sporting participation amongst the public, encouraged by the State and the Medical Profession - a result of this is a substantial number of people will be injured. Yet efforts to help these injured sportsmen are variable, often a function of where the patient lives or whom he knows. Often these efforts are inadequate, for example, the number of patients with inversion injuries of the ankle who have attended Accident & Emergency Departments and later had to attend the Tryst.

At the same time, the attempts to help the injured sportsman are a function of individual doctors and physiotherapists' enthusiasm as a hobby - this study is the result of two individuals' interest and sacrifice. It is evident that the numbers of such individuals are growing - the Tryst was the second Scottish Sports Council grant aided Clinic and there are now twenty two such Clinics. Courses in Sports Medicine and lectures locally are well attended, popular and regarded as useful even to Practitioners not especially interested in the subject - the popularity of the talk on Sports Injuries to the G.P. trainees in the West of Scotland.

In contrast to many parts of Europe and Australia, and the commercial enterprises in the United States, Sports Medicine and Sports Injuries in Britain are at a level of a hobby, rather than a true part of the curriculum. There are two fundamental reasons for this - a lack of provision made for Sports Medicine and Sports Injuries by the National Health Service and by governing bodies of sport and a lack of teaching at Undergraduate and Postgraduate level. Spokesmen for the National Health Service have stated that it has not the time nor resources to deal with the "luxury" of sports/

/sports injuries. Although it is hard to argue for resource for a knee that is aching after four miles of running when contrasted with the waiting lists for patients awaiting coronary bypass operations, a case can be propounded that curing the source of the runner's aching knee might prevent his coronary bypass operation at some time in the future.

The Sports Councils, the Scottish Health Education Group and the governing bodies of sport cannot wash their hands of responsibility. If these bodies actively encourage people to perform an activity which, regrettably, has side effects such as injury, then there is a strong moral responsibility to help those people who are injured to overcome the injury sustained by such an encouraged participation.

Looking at these two aspects in the light of experience at the Tryst, there are fundamental suggestions to be propounded.

Many subjects within medicine claim that the Undergraduate receives little time in that particular subject but surely exercise, exercise physiology, the effect of sport on medical conditions, the effect of medical conditions on sport and finally, injury in sport, are aspects that intrude into everyday life of millions of people and yet the medical student learns little, if anything on these subjects. It is said that there are several axioms the medical student must know before being allowed to practice - an example from obstetrics being that a doctor should never perform a vaginal examination on a patient with an ante-partum haemorrhage. The Medical Officer in his General Practice career of over 700 full ante-natal care patients, has experienced only two patients with ante-partum haemorrhage, yet in every week of his General Practice career, advice is given on injuries relevant to sport. Thus, if the medical student responds to a patient with an injury by prescribing "blind rest" should he be allowed to graduate and become a Casualty House Officer or General Practitioner who will frequently be asked for advice on such injuries.

There is a place for sports medicine while studying physiology and biochemistry and recently Glasgow University have allowed Medical Students to do a B.Sc. in Sports Sciences. Recently at a conference of Scottish Sports Injury Clinics, a Medical Officer at another Sports Injury Clinic confessed that he had learned more about physiology from his Sports Medicine course than in his Undergraduate career because of its immediate relevance to his own running and to that of the patients he treated. He similarly confessed that his knowledge of practical biochemistry involving the utilisation of fuel, had improved by his need to know how to conquer the glycogen depletion he experienced in the marathon. The role of exercise in the management of cardiac problems such as post myocardial infarction is now being recognised in the United Kingdom, years after countries such as Canada and the United States had learned this lesson.

Surprisingly, another crucial area where exercise has a positive and important role in health is in the care of the elderly. Dr. J. Wilson, Consultant Geriatrician at Bangour General Hospital in a paper reviewing the literature and proposing appropriate exercise programmes in the elderly (54) outlines the concept of crossing the "threshold of independence". This concept has implications for the quality of life and social and economic consequences of supporting the elderly. The two simple functional examples that Dr. Wilson quoted were firstly:- A female of 85 who has spent two weeks in bed, requires a maximal heart response just to dress and undress. It is therefore very important that her heart response rate would be kept as good as possible prior to any confinement in bed. The second example Dr. Wilson quotes is that the average 80 year old healthy female requires a maximum quadriceps contraction to rise from a low chair or from a toilet seat. Thus it is again crucial to maintain the quadriceps power as much as possible in the elderly.

Dr. Wilson goes on to quote papers from Scandinavia and the United States which show that even in the frail elderly, exercise programmes /

/programmes could be instituted with maximum benefit if properly maintained. With an ageing population, exercise programmes for the elderly offer hope and will need both exercise minded Geriatricians and Physicians qualified to offer advice on Sport and Medicine.

In the 1970s it was possible to go through Medical School without meeting a Physiotherapist unless involved with post-operative chest postural drainage or the rehabilitation of a patient with a cerebro-vascular accident. Yet after graduation and working as a Casualty Officer, Houseman in Orthopaedics, Houseman in the Medical Wards and finally a General Practitioner, the Doctor may become the gateway and referral source to Physiotherapists. Surely such decision and referral should be backed by a knowledge of the information required by the Physiotherapist and made with an understanding of the ways that the Physiotherapist can help the patient concerned.

The case for inclusion in the Undergraduate curriculum of many of the above aspects is virtually irrefutable. Only the will to make it happen is absent.

At a Post-graduate level there are many "battles being won", such as the G.P. training lecture; the ease with which Post-graduate Deans will now sanction Section 63 permission for courses and lectures in Sports Medicine; the inclusion in many Post-graduate Centres of lectures in Sports Medicine. The Diploma in Sports Medicine now being organised by the Society of Apothecaries offers a means of accrediting Doctors with an interest in this field. There is, however, still much to be achieved in this field. If the hopes of educational changes at Undergraduate and Post-graduate are to be realised, then there must be a parallel development in the management of Sports Injuries and Sports Medicine, within and without the National Health Service. There is also a serious obligation on the enthusiast for their subjects to produce proper full analysis of their work, observations of patterns and applications, and future research producing papers of sufficient scientific stature to convince the sceptical members /

/members of the profession.

Within the National Health Service with its predeliction for the management of ill health, it is difficult to see a place for Sports Injuries and Sports Medicine although the recent White Paper "Working for Patients" (55) with its vision of Opt Out Hospitals and General Practitioners budgets, offers an interesting scenario if such a hospital were to offer a Sports Injury service to the budget holding General Practitioner.

The way forward for future development for the care of the injured Sportsman has to be through some form of insurance. While the acute contact injury will still report to Accident & Emergency in the National Health Service, soft tissue injuries rehabilitation will need to be via Sports Injuries Clinics. Where Sportsmen get a free or cheap service, there is scope for abuse as illustrated by Grisogono (15) and also by the abuse of the re-referral system at the Tryst when the patient produced new injuriès when supposedly being reviewed for a previous injury. A free service can lead to the concept of "a massage parlour for the neurotic athlete's fears". There is a place for such a service in the form of the team or touring Doctor, but when such patients deprive other athletes or patients of time and resource, it is unacceptable. Equally, it is unfair to encourage sport and its resultant injuries and then make large amounts of money from those injured in such sports, especially as at the Tryst, 16% of those injured were under 16 years of age. The ideal compromise would be an insurance based scheme, perhaps incorporating the governing bodies obligation to take more responsibility for the injured who indulge in their sport. Society finds it reasonable to ask drivers of cars to take out insurance for accidents and for employers and public places to provide Public Liability insurance, shouldn't sporting bodies have an obligation to provide such a similar cover? The Southampton Study (9) showed that /

/that in under 35 year olds, there were more accidents and emergency attendances as a result of sport than those attending due to Road Traffic Accidents.

Given the existence of such a scheme then the present semi-voluntary centres, supported by the Sports Council and other new Clinics, which might easily be situated with National Health Service premises, could provide true primary care to injured sportsmen. Operating in a full professional manner with part-time or full-time members of staff.

There would need to be centres of excellence for referring the difficult problems and for co-ordinating and developing research. Here, Universities are ideally situated to provide the second tier, particularly if involved with a teaching hospital. They would also liaise with Sports Coaching Centres, such as Moray House in Edinburgh and Jordanhill in Glasgow. Such a centre could organise research involved in primary care, deal with the difficult cases, provide education for athletes, coaches, sporting bodies and provide the education for medical Undergraduates and Post-graduates. Such centres exist in Europe, United States and Australia - why not in Scotland? Would not such a centre of excellence perhaps attract suitable outside sponsorship or be an attractive proposition for some large commercial concern.

Until such centres exist, there is an obligation on those active in sports medicine to establish research, analysis and development of Sports Medicine. One such new scheme to help these aims is the Scottish Sports Council standard medical form (see Appendix 1F). This is completed by the patient and Doctor or Physiotherapist at the local Sports Injury Clinic and returned to the Sports Council for analysis. Most of the grant aided Clinics have been encouraged to participate. Since Cumbernauld sees 200 patients a year and is neither the largest nor the smallest of these Clinics, then these forms could be completed and represent 4,000 patients per year. /

/year. In a short time, there would be an excellent data base available for the analysis of sporting injury. This form offers potential for organising research as different Clinics carry out different treatments or co-operate to provide sufficient numbers to justify a true clinical trial of various treatments. This method allows a "Group of one man/ one woman bands" working in relative isolation to participate together in this research.

The first analysis of the standard form has been distributed to the Clinics (56). 754 patients were analysed, representing six months workload of nine Clinics. Amongst other factors, it shows a substantial loss of work amongst injured sportsmen. It also shows that 50% of these patients had seen other Doctors prior to attending the Sports Injury Clinic. One surprising feature is the large number of older sportsman who had not warmed up adequately prior to the activity in which they were injured. The survey also found that 21% of those sportsmen were either in National or District squads. An attempt was made to analyse recovery and while this was difficult to quantify, it was estimated that 49% made a complete recovery, 29% made a partial recovery and 23% had no change.

These initial returns provide many important lessons to supplement those of this study. The loss of work, due to sport provides a sound argument for the expansion of sports medicine in an attempt to reduce this. Dissatisfaction with previous opinions also adds support to the development of true excellence in primary and secondary care of sports injuries.

The number of experienced sportsmen who did not warm up and were injured, reinforces the importance of the educational role to propound to the athlete. The fact that many athletes attending these Clinics are of National or District ability, emphasises that if the country wishes to bask in the success of its national representatives, and judging by the newspapers, it seems to do so, then it has a responsibility to help /

sportsmen avoid injury and rehabilitate quickly and effectively if they are injured. 25% in whom the Primary Care Clinics were unable to provide any improvement lends emphasis to the pleas already made for centres of excellence for difficult cases. This compilation of important information can be used to convince the profession and the Government to act. Concerned individuals coming together to act collectively can alter medical matters. Doctors, as individuals, through organisations like the Medical Commission for Accident Prevention and the British Medical Association, have changed the laws on motor cycle helmets and seat belts in cars with benefit to all. Similarly, in Rugby Union Football, the Medical Officers of the various countries have been instrumental in altering the laws of the sport to make it safer. Thus, those that are interested in exercise for health, Sports Medicine and the prevention of injury, must lobby to obtain similar benefits for their patients.

The establishment of Sports Medicine and Sports Injury programmes at local level with centres of excellence publishing research, may yet be a dream, but the reality is now closer than at any time in history.

This account is written in the hope that the lessons learned at the Tryst might help other Doctors to assist other sportsmen and perhaps contribute a little to the development of knowledge of sporting injuries.

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ENDIX 1 CARD A

2-1983.

TRYST SPORTS INJURIES CLINIC

No. 30

OCCUPATION COMPUTER MANAGER	AGE 6/12/55	Reg. Date 13/9/82
		Sport CRICKET
S G.P. DR. SEWELL KILSYTH		Ref. Code COACH
		Place of Injury
D.H. ALLERGY N/A		
Y AND EXAMINATION # Tibia low 1/3 Left 81 POP 8/52 Stress # on Lln May 82 - POP 2/52 all clear ... Cant run or play adequately (R) Tibial ... ankle stiff ... and flat Achilles tendon ...		Diagnosis Poor Rehab post POP for # Tibia (R)
ENT No rehab at all. R ref P/T ? US ? faradism strengthening		
		Outcome

APPENDIX 1 CARD B

1983 - 1986.

	AGE: 24	DATE: 15th AUG 1983
		287
: P.E TEACHER.	SPORT: FOOTBALL	
ALLERGY:	Goalie	

EXAMINATION:

Dec 82 - Inversion injury (R) ankle

Reinjured 8/7 ago football

O/E effusion tnt mal

Talus. neuro

leg norm.

Inv (R) Ankle.

:

1/ ?Ia

2/ US

3/ [illegible] sheet.

868

TTISH SPORTS COUNCIL

RECORD

TRYST

SPORTS MEDICINE CENTRES

DETAILS

Date 3/3/86

..... First names .....

Date of Birth 12/6/45

Male ☑ Female ☐

Phone 37707

..... Occupation SUPERVISOR

DR SMITH Address TOWN CENTRE

Club ☑ Self ☐ GP ☐ Other ☐ (specify C/NAME - KILSYTH LEAGUE)

Affiliated club ☑ Non-affiliated club ☐ Self ☐

Insurance ☐ (specify .....)

1 BADMINTON 1 2 3 (4) 5 | 2 ..... 1 2 3 4 5 | 3 ..... 1 2 3 4 5 | 4 ..... 1 2 3 4 5

load: Miles per week ..... Training sessions per week .....

MEDICAL HISTORY

similar injury ☐ When ..... How sustained .....

.....

.....

.....

.....

Illness in previous 3 months .....

.....

INJURY

lays from injury) 14 days Chronic (duration of injury) ..... weeks

ustained during: Warm up ☐ Training ☐ Event ☐

Competition ☑ Warm down ☐ Other* ☐

ify N.B. a cunt has my cold.)

PENDIX 1 CARD D
87 ONWARDS

THE SCOTTISH SPORTS COUNCIL

Medical Record - Tryst Sports Injury Clinic 30/3/87

1008

: ____ Christian Name: ____ D.O.B. 7.7.62 Sex: M

:

tion: WAREHOUSEMAN Ref: C: S/C: G.P. P.E. O

R. NORRIS Address: HEALTH CENTRE Sport: FOOTBALL Saltmarket YMCA

CUMBERNAULD Standard 1 2 3 4 5 4/M league

lergies:

History: 2/52 Sunday. 50% 40% ball tackle AC 15/7 CR

flex + INV (R) Occurence: Sust. W/V: T: E: C: WD: O

Change E: T: S: E: C: P.

ation: swelling - settled resumed.

cnt tackle

ent: o/c. mildly Fd Td

also Fd / Tal lig

Inv Injury (R)

Rx U/S lecture about - ? strapping

Diagnosis: (R) INV INJ

Review 3-4/52

APPENDIX 1 CARD E

CARD IN CURRENT USE:

	Age:	*Date:*
		No.
on: ?	*Sport:*	
Allergy:	*G.P.*	

Examination:

t:

Clinic Code

Case Number

edicine Centre

Start of patient completion section

(Circle appropriate option or fill spaces)

st attendance:

Address:

e No:

on:

ıle Female Age: D of B: Height: Weight:

GP:

of GP:

Referral: Self Coach Club Physio GP Other

ated to injury): 2nd Sport (if any):

ndard: 1 2 3 4 5 1 2 3 4 5

de: *1=National 2=District/City 3=Club 4=Recreational 5=Beginner*

f years in main sport:

rmally warm-up before training? Yes No

rmally warm-down after training? Yes No

f Injury

jury: Site of injury:

g worse? Yes No

her player involved? Yes No

equipment involved? Yes No If yes, specify:

injury in your own words:

received any treatment for this injury? Yes No

n whom: Self Coach Physio Doctor Other

n did this treatment take?

ury, how often on average would you train/compete in a week?

i had a previous similar injury? Yes No

en? Diagnosis:

t:

l, for how long? Days/weeks:

, for how long? Days/weeks:

End of patient completion section

Physiotherapist Summary

omplete before separating copies. Return top sheet to the Scottish Sports Council)

s:

ven:

t 1: No of sessions TR1

t 2: No of sessions TR2

: Complete recovery Partial recovery No change Worse

GP X Ray Orthopaedist Other specialist (specify)

e date:

The Scottish Sports Council
roduced by the Consultative Group on Sports Medicine and Sports Sciences
1 St Colme Street
Edinburgh EH3 6AA

APPENDIX 2 (i) KILSYTH HEALTH CENTRE ANKLE EXERCISE SHEET

You have suffered a sprained ankle and to prevent recurrence and to speed recovery, some helpful exercises are recommended.

BALANCE: To be started as soon as is possible unless there is severe pain. To be repeated three times per day.

a) balance standing on injured foot only for five seconds

b) stand on the injured foot only with eyes closed for five seconds

c) stand on the injured foot with hands raised above head clapping hands for five seconds.

d) stand on the injured foot solo while throwing a ball above the head.

Repeat on tip toe a) to d).

WOBBLE BOARD: (A flat piece of wood on a rolling pin or the children's toy know as "Lo Lo Ball" will do.)

Practice balancing on this in all directions and then practising balancing and throwing a ball against a wall.

ISOMETRIC STRENGTHENING: (Not to be carried out if there is a heart condition or any history of high blood pressure.)

This allows strengthening without movement.

Place uninjured foot's sole on top of the injured foot and press upwards and downwards at the same time without movement for five seconds. This can be repeated on six occasions. Similarly, push the outside and inside of the injured foot against an immovable object for a five second spell.

DYNAMIC: If able to walk comfortably then it is time to get the foot moving and strengthened.

1) sitting on a kitchen table with the knee against the edge of the table, use the ankle to lift slowly a gentle weight situated on the foot, e.g. a handbag.

2) sideways stepping, hopping or skipping.

3)/

/3) bench jump or shuttle runs.

4) run backwards round a figure of eight progressively making the circle smaller. This is a useful fitness test.

N.B. No exercise should be carried out if causing pain.

APPENDIX 2 (ii) ANKLE SHEET USED AT TRYST BASED ON GRISOGONO: REPRODUCED WITH HER PERMISSION

1. Control persisting swelling

After a severe injury the ankle may continue to swell up, especially at the end of the day after long periods of standing still. It is important to control this swelling, partly because it will make the ankle throb and feel uncomfortable, and because it will interfere with the joint's normal functioning.

As often as possible during the day and every evening you should try to support your leg with your foot raised above the level of your hip. For instance, sit with your foot on a stool, with a cushion supporting your lower leg or, if you have to sit with your legs down, straighten out your knee now and then to lift your foot in the air. If the evening selling is very bad, it may be helpful to put a bolster under your mattress to raise the foot end of your bed slightly; this will help the swelling to drain away overnight, but you should not do this if it interferes with your sleep.

Try to keep your foot moving as much as possible. When you are sitting down press your foot up and down from the ankle frequently to help promote good circulation in your lower leg. If you have to stand for a long time try to keep your legs moving by bending your knees slightly one at a time or by going up and down on your toes, or by lifting your toes up from the floor on each foot in turn.

You should also do a daily session of contrast baths or ice treatment. For contrast baths fill two buckets with water, one as hot as your skin can stand, and the other with a tray of ice in it. Place your foot alternately in each bucket for about 15 minutes, drying the foot between each dip. While your foot is in the water you should move it around in straight and circling movements, to help the blood circulation and to increase the joint's flexibility. If ice treatments are more convenient, either put /

/put some ice in a damp towel and wrap it round the ankle or ice cubes over the ankle until the skin turns pink (or becomes darkened, if you are dark-skinned). If possible, you should apply the ice treatment with your foot raised and supported.

Whenever you have to stand or sit with your foot down, for any length of time, you should support the ankle and lower leg in a compressive support, such as a double Tubigrip, extending from your toes to just below the knee. If the ankle swelling is only mild, it may be enough to have the support reaching from your toes to the fleshy bulk of your calf muscles.

2. Support bandaging

If your ankle feels weak, it may be advisable to support it, to protect the ligaments, as far as possible. It is never a good idea to strap an ankle in order to do activities which would otherwise cause pain. The pain indicates that the ankle is not ready for such activities as running. If you immobilise the joint, you interfere with the co-ordinated action between all the leg joints from the hip (and lower back) downwards, and you may therefore cause damage to one of these other joints.

The simplest way to provide some necessary support for the ankle without creating false confidence and without impeding the ankle's normal movement, is to wind a strap of one-inch zinc oxide tape from the inner side of the ankle, to about four inches above the tip of the fibular malleolus, cover the strip with two more, each slightly to one side of the first strip then cover the whole with a 'stocking' of double Tubigrip, up to the knees, if there is still a lot of swelling, or to the calf muscles.

To remove the zinc oxide tape without discomfort, use a proprietary substance like Zoff, available from most large chemists.

3. Exercise

Provided there is no reason why the ankle should be totally immobilised, you should start moving the foot as soon as the pain allows. If you are under specialist care, your specialist will advise you how much you should /

/should do during each phase of recovery. In principle, rehabilitation starts with free exercises for the non-weight-bearing foot, firstly in the straight up-and-down movements (plantarflexion and dorsiflexion) and then in circular movements, rotating the foot. As soon as the pain allows, you can start walking on the foot, but avoid twisting it, and avoid painful stresses.

Balance exercises: The first priority after an ankle injury is to regain good function in the balance mechanisms which operate through the ankle.

1. Stand on one leg, keeping quite still and holding your balance. Count how many seconds you can hold the position, and try to increase the time. Repeat on the other leg. (Six times, three or four times daily.)
2. With your eyes closed, stand on one leg, holding your balance. Try to increase the time you can hold the position. Repeat on the other leg. (Three times, three or four times daily.)
3. Stand on one leg, holding your balance, and raise you arms above your head in free arm movements as many times as you can while keeping your body still. Time yourself aiming to increase the duration of the exercise each time you do it. Repeat on the other leg. (Three times, twice daily.)
4. Stand on one leg, with a light football or similar light object in your hands. Throw the ball up in the air and catch it as many times as possible while maintaining your balance. Repeat on the other leg. (Two or three times daily.)
5. Stand on one leg; go up and down on your toes as many times as you can. Repeat on the other leg. Do the exercise once a day, but gradually increase the number of heel raises.
6. Stand on one leg with your foot flat on the floor. Keeping your foot flat bend your knee forward over your ankle, then straighten the knee to go up on your toes. Bend the knee again in a continuous movement, /

/movement, and continue the sequence six times, building up to 15. Repeat on the other leg. (Once daily.)

7. Stand on one leg with your toes on the edge of a stair, your heel over the edge. Let your heel drop downwards, then go up on to your toes, then back down over your heel, in a continuous movement, six times, building up to 15. Repeat on the other leg. (Once daily.)

8. Wobble board exercises. A wobble board consists of a smooth upper surface with a rounded "rocker" attached to its underside. A circular board with a hemisphere underneath is the ideal wobble board and is available commercially. To make your own, simplified wobble board, attach a foot-square piece of wood with nails or glue to a wooden rolling pin.

   To use the wobble board for balance exercises, place your foot in the centre of the board and try to hold your balance keeping perfectly still. Time yourself and aim to increase your balance time each time you do the exercise. If you are using the rolling pin type of wobble board, place your foot first in line with the rolling pin so that you are balancing in the side-ways direction (inversion and eversion), and then across the rolling pin to balance in the forwards and backwards direction (plantar and dorsiflexion). You should aim to hold your balance on either leg for 20 minutes continuously, and you should practise on the wobble board at least twice a day.

9. When you can hold your balance on the wobble board for 20 minutes, you should make the exercise more difficult by balancing on the wobble board and throwing a light ball against the wall, or to another person. Alternatively, you can do arm movements, especially above your head, to raise your centre of gravity and make balancing more difficult. Do this on each leg in turn, timing yourself at least once a day.

Isometric Exercises:

These are useful strengthening exercises, in situations where you cannot do the balance exercises. For instance, you can practise these movements while sitting at your desk or table during the working day. The exercises can be done when you are sitting with your feet down on the floor, or when your legs are stretching out in front of you. You should not do isometric exercises, however, if you have a heart condition, or you suffer from high blood pressure, as this type of static exercise can cause an increase in blood pressure.

1. Place foot on top of the other. Press the sole of the upper foot downwards, while pressing the lower foot upwards against it, so that the muscle work is balanced and no movement occurs. Hold the pressure for a count of five, then relax completely. Change over foot positions and repeat.
2. Place the outer edges of your feet together. Press them against each other, count to five, then relax.
3. Place the inner edges of your feet together. Press them together for a count of five, then relax.

   Do these exercises six times, two or three times a day, or whenever you can.

Dynamic Exercises:

These are more demanding exercises, mostly involving strong work at the ankle, and co-ordinated movements at other joints. You should not try them until you have worked for at least a week on the balance exercises, and you can walk and run slowly without pain. If any of the exercises cause you pain, you should leave that one out. Otherwise, you should select six exercises from the list to do each day, either simply as ankle exercises, or as part of a fitness training schedule.

1. Dorsiflexion weights. Sit on a high chair or table with your knee bent, foot down. Attach a weight over your foot. Keeping your knee and ankle at right angles, lift your foot upwards and outwards (so /

/(so that the outer border lifts up), count to three, then slowly lower your foot to neutral. You can make a simple weight using an oven glove, with sugar bags on each side. Do this in three sets of 10 on each foot, and increase the weights each week.

2. Cross-legged stand-ups. Sit in a chair with your ankles crossed, feet at right angles to your knees. Stand up without altering your feet, then lower yourself to touch the seat of the chair without sitting down. Do this in a continuous movement 10 times, building up to 30.
3. Side-steps. Walk sideways along a straight line, crossing one foot in front of the other. Do 30 paces to the right, then 30 to the left.
4. Side-jumps. Keeping your feet together, jump sideways along a straight line, 20 times in each direction.
5. Hop forwards along a straight line for 20 hops. Repeat on the other leg.
6. Hop sideways along a line for 20 hops in each direction, then repeat on the other leg.
7. Draw two lines, a foot apart. Hop from one line to the other, as you hop forwards, 30 times. Repeat on the other leg.
8. Alternate leg thrusts. Crouch down on the floor, resting on your hands. Kick one leg straight out behind you to touch the floor, then bend it up to the crouch position again, while you kick the other leg behind you, in a continuous movement. (20 times each leg.)
9. Kicking. Stand about six feet away from a wall. Kick a rubber ball against the wall, continuously, so that it returns to you, 20 times. Repeat on the other leg, and increase your distance from the wall each week.
10. Sideways kicking. Stand about four feet away from the wall, sideways on. Kick the ball with the outer part of your foot against the wall, in a continuous movement, 20 times. Repeat on the other foot.
11. Sideways Kicking as (10), but kick the ball with the inner part of your foot.

12. Shuttle runs. Mark out a run of about 30 paces. Sprint as hard as you can between the markers, touch the floor and turn back, timing yourself for 10 sprints at a time between the markers. Rest for 15 seconds, then repeat the sprints. Make sure you turn alternately in each direction at the markers. Do the sprints five times, building up to 12.

13. Backwards figures of eight. Run as fast as you can backwards, describing figures of eight. Start with large loops, then make them as small as you can. Do sets of 10, building up to 30 figures.

14. Bench jumps. Stand with your feet on each side of a bench. Jump up to kick your heels together above the bench, landing on either side of the bench. Start with five, build to three sets of 10.

15. Skip. Skip on alternate feet (not both feet together), forwards, backwards and in circles. Start with one minute skipping and try to build up to five minutes.

PHASING RECOVERY

Remember not to try to put weight through your injured ankle until the initial pain has receded enough to let you walk reasonably comfortably. This could be within three days to two weeks after the injury, depending on how severe it is. Once you can bear weight through the ankle, you must start the balance exercises, which you should maintain for at least six months, and preferably for the rest of your active life, as a daily routine. About a week later, as the pain and swelling allow, you can try to jog on a flat even surface, in a straight line. Start with about a quarter mile or less, allowing plenty of recovery time. Stop if you find that your ankle becomes more painful or swollen as you jog. Gradually build up your running, over about four weeks, firstly building up speed, and then running round bends, or turning. At this stage, you should start the dynamic exercises, which will strengthen your ankles enough to protect them when you run over uneven ground. The dynamic exercises are a good test for your ankles. Once /

/Once you can perform them efficiently, and without pain, you can consider your ankle injury recovered, and you can resume your normal running routines.

However, you must remember during the various phases of your recovery, that you must not exercise through increasing pain in your ankle. If your injury is aggravated by any type of exercise, and the pain does not wear off quickly, but becomes worse, you must rest the ankle, and, if necessary, refer to your doctor for specialist help. Meanwhile, to keep fit, you can still do alternative forms of exercise for fitness, such as swimming or cycling, provided that these do not cause problems for your ankle.

APPENDIX 3 PROTOCOL FOR TRIAL TO INVESTIGATE METHODS OF TREATMENT FOR ANKLE LIGAMENT INJURIES.

SUMMARY

This is a single blind study with independent assessor to investigate the most effective method of rehabilitation after ligamentous injury of the ankle. The study will be based on an Accident and Emergency Department. Three hundred patients with ligamentous injury of the ankle and no fracture will be involved.

There will be three treatment groups. Treatment (a) will receive support bandaging and advice from the Casualty Officer. Treatment (b) patients will receive support bandaging and be referred to Physiotherapy Department within 72 hours. Treatment (c) patients will receive support bandaging and be given a simple leaflet of exercises to perform on their own.

Patients will be studied over six weeks duration and the severity of injury will be recorded using two primary and three secondary parameters at three weeks and six weeks.

OBJECTIVE OF THIS STUDY

1. To determine if physiotherapy referral produces a quicker and/or better rehabilitation after an ankle ligament injury than simple advice.
2. To determine if a simple advice leaflet can give quicker or better rehabilitation after ankle injury than simple advice.
3. To compare simple advice leaflet with physiotherapy treatment.

DURATION OF STUDY

The study will run until 300 patients are recruited and they have been treated for six weeks.

STUDY DESIGN

The study is a prospective single blind with independent assessment, parallel group study with three treatment arms and will take place in one /

/one Accident and Emergency Department. Randomisation treatment will be allocated on the basis of a predetermined randomisation code.

PATIENTS - Numbers to be entered.

300 patients will be entered, with three groups of a hundred, the study would have adequate statistical power to detect differences in the cure rates of the order of 15%.

CRITERIA FOR ENTRY INTO TRIAL

1. Males and females aged over 18 years and under 65 years.
2. Patients must have sustained a recent (48 hrs.) ankle ligamentous injury with no bony damage.

Informal verbal consent will be obtained from all participating patients.

CRITERIA FOR EXCLUSION FROM TRIAL

1. Any bony damage sustained in the injury.
2. Pre-existing arthritis in the ankle.
3. Any other physical deformity of lower limbs.

TRIAL TREATMENTS

1. Casualty Officer giving simple support bandaging and elementary advice.
2. Physiotherapy assessment and treatment involving electrical modalities such as ultrasound, interferential, short wave diathermy; curapulse or T.E.N.S. Exercise regime under physiotherapist supervision involving strengthening, stretching and balance exercises.
3. A leaflet which recommends simple balance, isometric and dynamic balance exercises.

CONCURRENT THERAPIES

Paracetamol type analgesia are permitted. Not permitted - non-steroidal anti-inflammatory therapy.

ASSESSMENTS

Assessment will be made on two single primary outcome variables; 1 being subjective pain, using a visual analogue scale, and 2 being the ability to run backwards round the figure of eight within limits of 15 ft. /

/15 ft. x 10 ft. This would be timed. Secondary variables would be recorded being in order 1. Swelling on the scale of 0 - 3. 2. Pain on stressing inversion 0 - 3 scale. 3. The ability to hop a maximum of 10 yards. This would be measured. Follow-up assessments would occur at three weeks and six weeks.

WITHDRAWAL OF PATIENTS

Reasons for withdrawal:

1. Patient's own request.
2. Side effects of treatment.
3. Protocol violations.

ADVERSE REACTION

All adverse reaction will be recorded.

ETHICAL CONSIDERATION

Patient consent - informal verbal consent will be sought and the Protocol will be submitted to the Ethical Committee.

DATA ANALYSIS

The groups will be compared initially to assess whether in spite of the randomisation there were any substantial imbalances between the groups at baseline in terms of either demographic data or severity of injury. The primary efficiency analysis would be comparison of the three treatment groups in terms of three and six week assessment of pain and functional ability, on a Kruskal-Wallis test. Secondary analysis would compare the other assessments to provide supporting evidence to the primary findings.

APPENDIX 4 RECOMMENDED STRETCHING ROUTINE.

THIS ROUTINE IS THE AUTHOR'S PERSONAL ROUTINE AND IS TAKEN FROM A LECTURE GIVEN TO THE EDINBURGH RUGBY REFEREE'S SOCIETY, OCTOBER 1987.

Stretching; All exercise, either as training or playing should be preceeded by a warm up, preferably with adequate stretching of the leg muscles. Stretching routine would include;

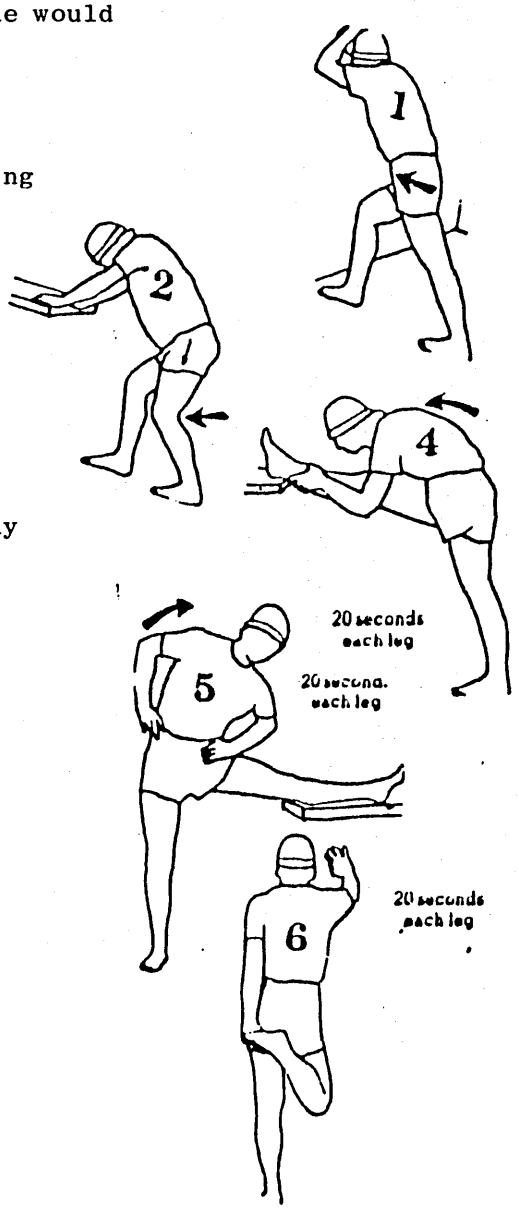
(a) Diagram No. 1. Calf stretch, e.g. hands on wall or car, stretching leg straight, tension being on the heel, the front leg relaxed.

(b) Diagram No. 2. Variation on the same theme, only bending slightly further forward to catch the other muscle on the calf.

(c) Diagram No. 4. Hamstring stretch. Preferably using a desk, bench or e.g. scrummage machine. Stretching leg held up straight and gentle lowering of the head and body towards it.

(d) Diagram No. 5. Groin stretch. Either the traditional bent knees, straight leg. One can use the bench, scrummage machine, as used in the hamstring stretch, with a lateral movement and bending of the other knee.

(e) Diagram No. 6. Quadriceps stretch. Pulling gently back with the bent knee, with pressure on the foot while the body remains straight.



APPENDIX 5 LETTER AND QUESTIONNAIRE TO RUNNERS ADVISED TO SEEK PODIATRIST ADVICE.

Dear

You attended the Tryst Sports Injury Clinic on
suffering from
and you were advised to seek Podiatrist advice.

We are currently following up all athletes who were given this advice and we would be grateful if you would answer the brief questionnaire overleaf and return in the stamped addressed envelope.

Many thanks for your co-operation.

Yours sincerely,

Dr. A.B. Walker

QUESTIONNAIRE

	YES	NO
1) Did you attend a Podiatrist after visiting the Tryst? (tick box for Yes or No)		
2) Did the Podiatrist recommend an orthotic device for the shoe? (tick box Yes or No)		
3) If Yes, was the orthotic device helpful in curing the injury? (tick box Yes or No)		
4) Are you still wearing the orthotic device? (tick box Yes or No)		
5) Are you still running? (tick box Yes or No)		