of the transverse colon. Each area was oval in shape in the long axis of the bowel, measuring approximately 2.5 by 1.5 cm., and situated on the medial wall close to the mesenteric attachment; each was sharply circumscribed, and the rest of the bowel appeared normal. A cuff of colon containing the most proximal area was resected, the area near the splenic flexure was oversewn and invaginated with a single layer of continuous catgut suture, and the third area was locally excised and the resultant defect in the bowel wall used as a stoma for the ileo-colic anastomosis. Recovery was uneventful.

These two cases indicate that ischaemic necrosis of the ensheathing layer can occur. We do not believe that the trauma associated with reduction had any part in the production of these changes, and for this reason we are loath to employ any method of primary anastomosis, with or without resection of the irreducible portion of bowel. The possibility of these changes occurring is a further factor influencing the choice of 48 hours as the optimum time interval between the two stages. Delay much beyond this time may be associated with perforation of one of the necrotic areas, with either a generalized or a localized peritoneal infection.

Post-operative Treatment

Consideration of the detailed management of the post-operative period is outside the scope of this article, but stress must be laid on the great importance of this phase of treatment, and tribute paid to the skill and enthusiasm of our paediatric colleagues, who have supervised the day-to-day care of these children. This care entails attention to the state of the child's nutrition, hydration, and oxygenation; correction of blood electrolyte changes; the use of antibiotics, sedatives, or stimulants as required; and, most important of all, frequent clinical assessments of the child's condition and progress. If these requirements cannot be fulfilled, then the child's prospects of survival are correspondingly reduced.

Summary

Ninety-one cases of intussusception occurring in infants and young children are presented. Of these cases 82 were reduced at operation with no deaths. Nine cases were irreducible and were treated by a two-stage procedure of resection and early restoration of bowel continuity with one death.

The reasons for employing the two-stage operation are discussed.

Attention is drawn to the possibility of ischaemic changes occurring in the outer layer of the intussusception in late cases.

Stress is laid on the importance of correct pre-operative and post-operative management of these ill children.

It is a pleasure to acknowledge the help received from Sir James Spence and members of his staff, particularly Dr. Donald Court and Dr. Hugh Jackson, in the preparation of this report. I should also like to thank Mr. John Gilmour for his constant encouragement and advice.

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THE ACCIDENT-PRONE IN GENERAL PRACTICE*

BY

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From a General Practice
Hawick, Scotland

Accidents are usually regarded as a hospital problem. While investigating the diseases encountered in family practice the importance of this subject to the general practitioner impressed me and seemed worthy of record.

My practice is situated in a small manufacturing town in the Scottish Borders. It is partly rural and partly suburban. The suburban population are mainly employed in the manufacture of high-class hosiery and tweed. These industries are not the cause of many accidents, so it is not of industrial injuries that I write. The extensive rural areas are concerned with sheep farming and, to a less extent, dairy produce. The total population of the area is about 21,000, of whom 17,500 live in the town and about 3,500 in the rural areas. My share of this population is 2,562, and of these 716 live in the country.

TABLE I.—Population at Risk

Age	M	F	Total
0-4 years	102	102	204
5-14 "	160	146	306
15-44 "	515	520	1,035
45-64 "	273	385	658
65+ "	155	199	354
Not stated	1	4	5
	1,206	1,356	2,562

Table I shows the age distribution of these 2,562 patients—a distribution which corresponds with what one would expect in a rural district. There is a relative deficit in pre-school and school age groups and an excess in the older age groups, taking Scotland as a whole.

Accidents Encountered

During the first two years of the National Health Service 401 of those 2,562 patients were involved in 468 accidents. I have classified those accidents according to the type of

TABLE II.—Type of Accident (All Cases)

Diagnosis	M	F	Total	Hawick %	Stirling %
Bruises	59	47	106	22.65	10.13
Sprains and strains	60	47	107	22.86	9.58
Fractures	32	20	52	11.11	19.06
Open wounds	56	16	72	15.38	38.49
Foreign bodies	19	7	26	5.55	8.20
General effects of internal causes	3	5	8	1.71	0.18
Burns and scalds	17	16	33	7.05	4.14
Head injuries	9	5	14	2.99	5.34
Crushing injuries	8	3	11	2.35	2.03
Other forms of violence	19	20	39	8.35	2.85
Total	282	186	468	100.0	100.0

injury, and for this purpose have adopted the classification used by Lockhart (1950) when he made a survey of the accident cases treated as out-patients or admitted to Stirling Hospital. This permits me to compare hospital figures with those of general practice, which, of course, includes cases treated in hospital or at home.

*This investigation formed part of the work undertaken while receiving the Ernest Hart Memorial Scholarship of the British Medical Association. I feel it should be more widely known that such scholarships are available to general practitioners who are prepared to do research in general practice.

Table II shows the type of injury encountered. There were 282 accidents in males and 186 in females. In all but two groups accidents in males were the more numerous, the disparity being greatest among open wounds, fractures, foreign bodies, and, to a less extent, among bruises and sprains and strains. In the last two columns my figures are compared with those of Stirling Hospital. It will be observed that general-practice figures are higher for bruises, sprains and strains, burns and scalds, and what are described as "other forms of violence." Hospital figures are higher for fractures, open wounds, foreign bodies, and head injuries—indicating that hospital figures show a bias in favour of severity. My own figures seem to confirm this. Of these cases, 37 were sent either to the Cottage Hospital (32) or to larger hospitals outside my own jurisdiction (5). Twenty-one were fractures, 8 were open wounds, 3 were severe sprains of joints, 2 were extensive burns, 2 were bruises, and one was a severe eye injury.

Significance of Accidents

Table III shows the significance of accidents encountered in general practice. It must not be assumed that the disability figures indicate the number of days off work or school; in many cases they do, but in others they do not—for example, a person with a Colles fracture may be at work or school with the arm in plaster, but is still regarded as incapacitated. It will be seen that in the males the 282 accidents caused a total invalidism of 1,953 days, with an average recovery rate of 6.9 days. The average recovery rates vary greatly, and suggest, what is true, that the injuries were most severe among those of school age. In Table III these accidents are compared with a number of the more common diseases which cause patients to consult their doctor.

In the male, in the pre-school years, accidents are surpassed in frequency by the common cold, infectious diseases, and skin conditions; and the invalidism caused by accidents is insignificant compared with that from infectious diseases and skin conditions, and is only half that of the common cold. In the 5-14 age group, accidents are exceeded only by the common cold, and the invalidism is much greater than from any other cause. In the 15-44 age group accidents are more numerous and the invalidism greater than in any other group. In the 45-64 age group the number of accidents and the days of incapacity are exceeded only by the number of arthritic and joint conditions. In the 65-and-over group accidents assume the insignificance that they show in the 0-4 group. The average time of recovery is slightly below the average for all causes.

In the female a different picture is seen. In the 0-4 group accidents are exceeded by the common cold and acute infectious diseases both in numerical frequency and in duration of incapacity. In the 5-14 group accidents do not assume the importance shown in the male. In the 15-44 group again their numerical frequency and the resulting invalidism are not comparable to those of anxiety states, skin conditions, and the upper respiratory infections, and are less than with the common cold. In the 45-64 group, accidents begin to be of greater significance and in numbers are surpassed only by the common cold, anxiety states, and arthritic and joint conditions; but the invalidism is still less than that of anxiety states, skin conditions, and arthritis. In the 65-and-over group, however, accidents are numerically inferior to many of the conditions, but are by far the most serious cause of invalidism. The average rate of recovery from accidents is the same as that for the male, but in my series the female rate of 6.9 days is higher than the overall average for the sex, which is 5.28 days. The prolonged recovery rate in the 65-and-over group is due to fractures of the neck of the femur being more common (with me) among the elderly females.

By the inclusion of the grand total of illnesses encountered in the first two years of the National Health Service, along with the resulting invalidism, Table III not only shows the importance of accidents but also illustrates the problem facing the general practitioner and what he should endeavour to reduce. It will be seen that the 4,148 ailments of the female caused an invalidism of 21,908 days, while the 2,810 ailments of the male accounted for 21,464 days. Though the males had fewer complaints, their recovery was more tardy in all age groups except that of 65 and over.

Seasonal Distribution of Total Accidents

The neighbourhood in which my practice is situated is mountainous, and during the winter months snow and ice-bound roads are a frequent occurrence. The wearing of

TABLE IV.—Seasonal Distribution of Accidents (Total, 468)

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	N.S.
30	32	30	41	54	48	54	42	35	36	39	25	2

chains on motor-car wheels is very often necessary. It might be expected that accidents would be more common during this period, but such is not the case. May, June, and July have the most accidents (Table IV). A partial explanation for this is our annual festival, which has been held

TABLE III.—Accident and Sickness Invalidism

	0-4		5-14		15-44		45-64		65+		Total		Average Recovery Rate (Days)					
	No.	D	No.	D	No.	D	No.	D	No.	D	No.	D	Total	0-4	5-14	15-44	45-64	65+
Males																		
Accidents	25	57	48	518	141	913	52	391	16	74	282	1,953	6.9	2.3	10.8	6.5	7.5	4.6
Common cold	54	107	49	183	69	216	39	156	34	106	245	768	3.1	2.0	3.7	3.1	4.0	3.1
Acute infectious diseases	36	324	33	259	13	104	7	113	2	28	91	828	9.1	9.0	7.8	8.0	16.1	14.0
Anxiety states	8	8	4	7	49	148	31	145	14	—	106	308	2.9	1.0	1.8	3.0	4.7	—
Skin conditions	36	127	20	168	56	568	24	277	20	64	156	1,204	7.7	3.5	8.4	10.1	11.5	3.2
Arthritis and joint conditions	9	—	7	67	77	528	60	461	18	158	171	1,214	7.1	—	18.3	9.2	7.9	33.7
Upper respiratory infections	7	115	10	140	14	150	13	347	9	117	53	869	16.4	16.4	14.0	10.7	26.7	13.0
Chronic bronchitis and pneumonia	—	—	3	20	4	—	2	79	18	145	27	244	9.0	—	6.7	—	39.5	8.1
All causes	416	1,541	363	2,394	994	6,870	652	8,010	380	2,649	2,810	21,464	7.64	3.7	6.6	6.9	12.3	7.0
Females																		
Accidents	18	58	18	76	60	153	61	402	29	604	186	1,293	6.9	3.2	4.2	2.6	6.6	20.8
Common cold	51	99	40	113	107	208	82	310	35	203	313	933	3.0	1.9	2.8	1.9	3.8	5.8
Acute infectious diseases	36	409	20	114	14	155	12	144	5	48	87	870	10.1	11.4	5.7	11.1	12.0	9.6
Anxiety states	4	—	5	6	121	886	80	505	48	231	258	1,628	6.3	—	1.2	7.3	6.3	4.8
Skin conditions	13	41	26	27	75	269	43	875	15	33	172	1,245	7.2	3.2	1.0	3.6	20.3	2.2
Arthritis and joint conditions	5	—	10	—	83	—	126	1,138	64	388	288	2,093	7.3	—	—	11.8	14.3	13.0
Upper respiratory infections	8	21	16	104	27	255	16	279	14	206	81	865	10.7	2.6	6.5	9.4	17.4	14.7
Chronic bronchitis and pneumonia	—	—	1	—	2	—	17	63	32	504	52	567	10.9	—	—	—	3.7	15.8
All causes	325	1,003	310	946	1,489	6,860	1,327	8,218	696	4,878	4,148	21,908	5.28	3.1	3.1	4.6	6.2	7.0

D=Duration of disability.

each year since 1514. It celebrates the defeat of the English army by the young men of Hawick the year following the battle of Flodden. This festival starts in May and culminates in three days of intense activity during the first week of June. It is a hilarious occasion and is a potent cause of accidents. This is not the whole explanation, however, since July is also a month of an increased number of injuries.

The Population Involved in Accidents

These 468 accidents involved 401 patients (239 males and 162 females). Table V shows the age distribution of these people along with the male and female rates as a percentage of the numbers at risk. The overall male/female ratio of

TABLE V.—Population Involved in Total Accidents

Age	No.		% of Group		M/F Ratio
	Male	Female	Male	Female	
0-4 years ..	22	15	10.7	7.3	1.46
5-14 " ..	44	16	14.3	5.2	2.75
15-44 " ..	114	56	11.0	5.3	2.07
45-64 " ..	43	50	6.5	7.6	0.85
65+ " ..	16	25	4.5	7.0	0.64
All ages ..	239	162	9.3	6.3	1.47

1.47 clearly demonstrates the male proclivity for accidents. The male in the tender years of 0-4 shows his adventurous spirit by a percentage of 10.7; this rises in the 5-14 group to 14.3%, the highest of all the groups. A reduction to 11.0% is seen in the 15-44 group, but middle age is well advanced before there is a dramatic fall to 6.5%, a fall that is more than maintained by the elderly male with 4.5%. The overall percentage in the male is 9.3. The female shows a different picture. The 0-4 female group shows 7.3%, but from 5-14 there is a fall to 5.2%, the lowest figure of all female age groups. Thereafter it rises to 7.6% for 45-64 group, the highest figure, and falls to 7.0% for the 65-and-over group. The overall percentage in the female is 6.3.

This variation between the male and female in the proclivity to accidents is best illustrated by the male/female ratio in each age group. The general male excess is 47%, but the male excess applies only to the under 45 age groups. In the two oldest groups the females have a decidedly heavier rate of accident. In the younger age groups the male rate is relatively greatest in the school age with almost three times that of the female, a 2:1 majority in industrial life, and a 46% excess in the pre-school years. In this series the accident liability shifts from the young male to the elderly female.

During the two years under review 202 men had one accident, 31 men had two accidents, and 6 men had three; 141 women had one accident, 18 had two accidents, and 3 had three. Thus 58 subjects had more than one accident. Table VI analyses these 58 patients according to age group. It will be seen that the young male and the elderly female are again those most often involved.

TABLE VI.—Age Groups of Those Having Multiple Accidents

	0-4	5-14	15-44	45-64	65+	Total
Males ..	5	1	24	7	0	37
Females ..	2	0	6	11	2	21
	7	1	30	18	2	58

Further evidence of a personal proclivity for accidents is furnished by the following facts: (1) Of the 239 males involved in accidents in 1948-50, no fewer than 74 (31%) had one or more accidents in the following two years. (2) Of the 162 females having one or more accidents in 1948-50, 34 (20%) had one or more accidents during 1950-2. These frequency rates are very much greater than the average risk of incurring an accident, and lead me to believe that the accident-prone person does exist.

Correlation of Accident and Sickness.—From previous work I was aware of the general sickness rates occurring in my practice, and in order to compare this with my accident cases I extracted the number of separate illnesses suffered by those who had had accidents. Table VII shows that the individual who is accident-prone is also sick-prone.

TABLE VII.—Correlation of Accident and Sickness

	Illnesses per Male	Illnesses per Female
General population ..	1.90	2.20
Those with accident ..	2.43	3.47
" " more than one accident	3.22	4.43

The general population rate of illness was 1.90 per male and 2.20 per female. Those with one accident had 2.43 per male and 3.47 per female. Those who had had more than one accident had even higher sickness rates—3.22 per male and 4.43 per female.

Town and Country.—In the present series, of the 716 patients living in the country, 94 (13.1%) were involved in accidents, whereas of the 1,846 living in the town, 307 (16.8%) had accidents.

Conclusions

Any conclusions I might arrive at concerning accidents must be considered to apply to my area only, unless similar findings have been discovered elsewhere. Many of my findings corroborate what is already known, but, so far, I conclude: (1) That the town dweller suffers more accidents than those who reside in the rural areas. (2) That there seems to be a seasonal distribution of accidents in my area. (3) That, though their number may not be very large, accident-prone persons do exist; and that the accident-prone are also sick-prone. (4) That the male is the more prone in the school and the early industrial age, and, to a less extent, in the pre-school years; and that the period of greatest frequency of accidents is also the period of greatest severity. (5) That the female is more prone than the male after 45 years of age, and that this is also the period of greatest severity of injuries among females.

Finally, I would like to express agreement with the leading article that appeared in the *British Medical Journal* of September 20, 1952 (p. 656), the last passage of which I quote: "It will probably prove more profitable in the long run to discover more about the conditions giving rise to accidents and about the limits of perceptual and motor response of the average person, so as eventually to modify the working environment and reduce the total risk, rather than to pick out the unfortunate accident-prone."

My thanks are due to Dr. Peter McKinlay for much help and advice with the statistical tables, and to my secretary, Mrs. Potts, for her care of my notes.

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The Ministry of Health has issued a booklet entitled "Your Blood and How it is Used to Save Life." It describes simply the composition of blood and the medical conditions which may need treatment by blood transfusion. Its purpose is to answer some of the questions blood donors are often asked. In explaining the great value of blood donations, it states that over half a million bottles of blood are required every year by the National Blood Transfusion Service. In order to meet the increasing demands, 125,000 new donors must be found in 1954, making a total of 600,000 active donors. Copies of the booklet are obtainable on request at blood donor sessions.