A REPORT ON DANCE INJURY PREVENTION AND MANAGEMENT IN AUSTRALIA

RESEARCH AND REPORT

BY

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He has taught extensively since 1974 at primary, secondary and tertiary levels, giving classes in classical technique, pas de deux, repertoire and creative dance. He has been guest teacher for numerous professional companies in Scandinavia, Australia and New Zealand.

After his retirement from full-time dancing in 1982, he obtained a Certificate in Anatomy, Neuroanatomy and Physiology in Oslo and then undertook extensive studies in Dance, Psychology and the body therapies in Stockholm, obtaining a Fil.Kand (BA), and a Teaching Diploma. He then completed an MA in Dance/Movement Therapy at New York University in 1989.

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ABSTRACT

This report presents the results of a survey of Australian professional dancers, 86% (172) of whom answered the questionnaire . Of these, 43% were male and 57% were female. It reveals that 86% of those responding are under 30 years of age, 52% of whom suffered a chronic injury by the age of 18.

Results are discussed in the context of the Australian dance environment and some comparisons made with an injury survey (smaller sample) undertaken in Britain by Bowling,1989.

Research into available material in the areas of injury prevention and management, body therapies, rehearsal and management practices, is discussed.

Guidelines are proposed for a theoretical framework for dance teaching. Recommendations are made for the adaptation of available material, the setting up of courses and dissemination of information on prevention and management of dance injuries.

Further research is recommended in the area of dance training, education and curriculum reframing to adapt the battery of new knowledge and research now available in the fields of dance science, sports science and sports psychology.

FOREWORD

The Safe Dance Project is the first report of its kind to be undertaken in Australia. It is a timely document supported by statistics and backed by extensive consultations within the dance and health care professions.

The report raises many significant questions associated with the education and training of dancers. Most importantly it draws our attention to the urgent need for a critical appraisal of both the content and methodology of the training systems that prepare our young artists for professional life.

In many ways this document also addresses one of the most basic principles which guided the founders of the Australian Association for Dance Education: to create opportunities for Australian teachers, choreographers and dancers to widen their own knowledge and understanding of their art form.

The late Dame Peggy van Praagh, who was both guide and inspiration to the Association in its infant years, was an ardent student throughout her working life, always open to new knowledge and always willing to consider new ways of doing things. The challenge with which we are now presented would have delighted her as new challenges always did, and as so many of us know, care for the well-being of dancers was high on her list of priorities.

We, the dance profession, are now being given the opportunity to educate ourselves with regard to the many issues discussed in this report. Having undertaken the task of investigation into the factors affecting the health and duration of the dancer's working life, Tony Geeves now invites us to respond to the Safe Dance Report's recommendations.

Shirley McKechnie, O.A.M .
(Foundation Life Member, A.A.D.E.)
Melbourne,
March 1990

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INTRODUCTION

The Brief

The purpose of the Safe Dance project, as stated in the original A.A.D.E. application for funding is: "To make accessible to dance movement specialists the advances in scientific understanding of the body now being made in the realms of sports medicine, injury prevention, nutrition and exercise physiology".

The fact that the dance community in Australia was so aware of the needs of dancers, and had already established an organisation (A.A.D.E.) effective enough to enlist the financial support of the federal government through the National Arts Industry Training Council, brings this country into line with the most advanced thinking in the field overseas and is extremely auspicious for the future of dance in Australia.

Philosophy

My own interest in injury prevention and management was stimulated towards the end of my dance career when I was also teaching. I realised that those dancers of my own generation who had successful careers and had lasted the distance were not necessarily those with the "ideal" body. I had already begun to search the libraries and computer banks for more knowledge and information.

I approached the Safe Dance Project in the knowledge that my traditional dance background, (complemented by academic studies and integrated with body/mind therapies) would enable me to accept and co-ordinate contributions from a multi-disciplined advisory panel concerning possible unsafe or archaic practices without being tempted to discard arbitrarily the valuable elements of the old system.

My intention is not to attempt to standardise or clone dancers, but to create a resource supporting the

personal development of the artist. I hope that this foundation will be of assistance to artists when they undertake the rigorous journey from training to profession, allowing them to keep their body image, physique and self-esteem intact.

My approach to the integrated personal process of the artist is holistic, and is proffered here in segments in an effort to facilitate understanding - which is a contradiction requiring a sympathetic reader.

"Our goal becomes then not to master or control our bodies, but to care for them and dwell in them with full awareness" (Stinson, daCi Conference Papers, 1985, p.209).

The reputation of Australian dancers is well established and respected both at home and abroad. This directly reflects the quality of the dance teachers and the network that supports them. This also makes it exciting to be chosen to examine training methods, educational prerequisites, medical needs and health care - in fact anything that will make dance safer, improve the quality and prolong the working life of the professional dancer, giving us the opportunity to enjoy the full range of powers of the mature artist.

Although the project is named 'Safe Dance' it should be clearly understood that dance artists employ a specific technique as a language with which to express themselves and communicate with the public. Extending themselves, experimenting with new choreography, and dancing "on the edge of their technique" is part and parcel of the art of dance and it is not the intention of this project to hinder that process.

With these thoughts in mind, I began work in Canberra in September 1989, reading through the volumes of relevant literature and becoming conversant with the Safe Dance project, the Australian dance community in general and its personalities in particular.

The method of approach

I have made a point of visiting each State and Territory during the period of the project, and have conducted local meetings and personal interviews with studio teachers, dance and movement educators, medical personnel, para-medical personnel, and body therapists (Feldenkrais, Alexander, Yoga, T'ai-Chi, Martial Arts, Body Mind Centering, and Dance Therapy) (see Appendix 4 for details).

They have added their recommendations and contributed important comments from their particular perspectives. During this consultation period I highlighted a number of points to pursue in depth when I was in possession of the collated statistics from the injury survey commissioned and distributed by the Australian Association for Dance Education (AADE) (a blank copy of the questionnaire appears in Appendix 2).

Until the results became available and I had conferred with the A.A.D.E. Safe Dance Advisory Panel members, I focused on the existing literature and explored the surveys and research programs already available in dance science and dance medicine both in Australia and abroad. Since the results of the survey are so vital to this project, I have decided to place them at the beginning of my report.

Tony Geeves
Canberra
March 1990

1. DESCRIPTION OF THE AUSTRALIAN PROFESSIONAL DANCERS' INJURY SURVEY

This survey of professional dancers' injuries was organised by the AADE National Office and sent out in July 1989 as part of the Safe Dance Project. It was based on a similar survey sent out to British dancers by the National Organisation for Dance and Mime, and although more extensive in scope, retains comparability with some of the U.K. questions. (See P. 12)

The returns were collated and described by Ann Clarke at the Department of Human Movement and Recreation Studies, University of Western Australia.

Sample

Dancers taking part were full time professionals working in fully or partly subsidised classical and contemporary companies, on the commercial stage and in television. Some independent artists were also contacted, but it is recognised that not every professional dancer in the country was reached.

The companies co-operating were: The Australian Ballet, Australian Dance Theatre, Dance North, Dance Works, The Meryl Tankard Company, One Extra Company, The Queensland Ballet, Sydney Dance Company, Tasdance, West Australian Ballet, Bharatam Dance Company, Dance Exchange, Expressions, Outlet, Still Moves Dance Laboratory, 2Dance Plus, "42nd Street" Company, Channel 9 Dancers (W.A.), Yellow Dog.

Due to the anonymity of returns it is not possible to specify percentage returns from individual companies. The companies invited to participate at the time of the survey employed approximately 200 dancers and ranged in size from four to 58 full time dancers. Of these, 172 returns were made. The commercial dancers involved were those employed solely as full time dancers for large commercial productions for a period of longer than six months.

The Arts: Some Australian Data, (Australia Council, 1989) lists a figure (from 1986) of 679 for dancers and choreographers (Arts Occupations, p 12). Many part-time dancers (not included in the A.A.D.E. survey) would appear in this figure, in the light of the census question, which was 'In the main job held last week, what was the person's occupation?'

Responses

- The response rate was 86% (172) of the population of 200 professional dancers to whom the survey was sent
- Of these responses 43% were from male dancers and 57% were from female dancers
- 86% of those responding were under 30 years of age
- 5% of respondents were over 35 years of age

Chronic injuries (old injuries giving continuing problems)

- A total of 65% of all Australian professional dancers responding suffer from chronic injuries. (42% male, 58% female)
- Of these, 39% are working in classical companies, 39% in contemporary companies and 22% in commercial work
- 60% of all classical dancers responding suffer from chronic injuries
- 70% of all contemporary dancers responding suffer from chronic injuries
- 64% of all commercial dancers responding suffer from chronic injuries
- The most prevalent chronic injuries are spinal (34%) ankle injuries (29%), and knee (15%)

- 52% of Australian dancers with chronic injuries are suffering from them by the time they reach 18 years of age. This figure jumps to 75% by age 25

Recent injuries

- 56% had suffered an injury within the last six months (preceding return of the questionnaire)

Site of recent injury

Spinal (lower back, back (unspecified) neck)	34%
Ankle	23%
Knee	13%
Foot	12%
Hip	4%

Type of recent injury

Ligaments/joints	34%
Muscles/tendons	33%
Stress fractures	12%

- 42% of these occurred during rehearsal (for which they say they were warmed up)
- 29% of these occurred during performance
- 15% of these occurred during class
- 10% of these were accumulative injuries
- 14% of injuries occurred within 3 weeks of a break from dancing

Techniques

- 37% of injured dancers were using classical technique
- 30% of injured dancers were using contemporary technique
- 15% of injured dancers were using modern technique
- 18% of injured dancers were using other techniques, such as tap or Indian dance

Dancers used both "modern" and "contemporary" in answering this question. Possibly, in this context, the terms are interchangeable and the two figures above can safely be combined, i.e. 45% of dancers were using a non-classical technique.

Personal opinions on causes of injury

- 26% overwork, repetition, fatigue
- 21% new technique, high-risk steps, difficult choreography
- 15% poor technique
- 15% of injured dancers claim they were not used to the particular technique required at the time of injury
- 15% reported not having adequate rehearsal at the time of injury

After injury

- 57% of dancers carried on as best they could immediately following injury
- 80% consulted someone within 4 days of the injury occurring
- 58% consulted physiotherapists
  (50% of these were classical dancers)

- 48% consulted massage therapists
  (49% of these were classical dancers)
- 31% consulted GPs
  (57% of these were contemporary dancers)
- 26% consulted osteopaths
- 22% consulted medical specialists
  (70% of these were classical dancers)
- 13% consulted acupuncturists
- 3% consulted chiropractors

Treatment

- 72% were given or used massage
- 43% were given or used manipulation
- 41% were given or used exercises
- 31% were given or used anti-inflammatory drugs
- 10% claimed the treatment they received was not helpful
- 34% of the injuries had healed
- 35% of the injuries had not healed, and dancers did not anticipate, or were uncertain about, full recovery

Information

- 23% were not given as much information about their injuries as they would have liked
- 37% specified that physiotherapists provided them with satisfactory advice
- 24% specified that doctors provided them with satisfactory advice

- 12% specified that they received satisfactory advice elsewhere (unspecified)

Prevention

- 30% expressed a belief in warm up as prevention
- 46% believed a knowledge of the body, its limitations and the rest it required was the most effective prevention
- 10% did not know how to handle an injury

Return to full work load

- Dancers are returning to a full work load on an average of 16 days after injury

This is significantly less time than it normally takes to recover fully from a soft tissue injury, such as a muscle tear.

Training

- Females average 9 hours per week in training at age 13, 12 hours per week at age 14, 22 hours per week at age 15
- Males average 5 hours per week in training at age 13, 6.5 hours per week at age 14, 11 hours per week at age 15

Females spend significantly more time at an earlier age training for dance.

There is a significant relationship between length of recovery time from injury and hours of training at age 13 (correlation 0.472).

Touring and performing

- 26% perform more than 6 shows per week
- Change in eating patterns was listed as the most negative effect of touring (56%), followed

by change in sleep patterns (48%) and change in digestive patterns (38%)

Female dancers

- 70% of female dancers responding have experienced or are experiencing amenorrhea
- 36% of female dancers responding currently have irregular menstrual cycles
- 34% of female dancers responding currently have irregular cycles or have ceased to menstruate altogether for a period of more than 3 months (excluding pregnancy) during their careers
- 60% with no menstrual problems danced less than 10 hours a week at age 13

The mean values for Body Mass Index were lower than the general population (20-25). 67% of all females showed a B.M.I. of less than 20.0

- 90% of females responding who rated less than 20.0 on the B.M.I. scale danced more than 5 hours a week at age 13
- 41% of females responding rely on take-away food, one or two meals a day and chocolate to supplement their diet

Comparison with sports injuries

It does not seem appropriate to compare dance injuries with sports injuries until such time as there is a systematic approach toward identifying and collating relevant dance data. It is hoped that this report will initiate further research into dance injuries, their cause and prevention.

The professional sports population is varied in range and type of activity (e.g. aerobic and anaerobic etc.) and the information available is predominantly on type, site, frequency and recovery time of injury.

The areas of knowledge from which the dance world could benefit are injury prevention, management and rehabilitation.

Some form of liaison with the Australian Institute of Sport (whose staff have been most helpful to this project) would be of immense value to the dance community, now that a start has been made in identifying exactly where application of the acquired knowledge is needed.

(a) Throughout the Australian Institute of Sport, a system of grading overuse injuries and their management has been developed (which needs no adaptation for dance).

OVERUSE INJURIES	SYMPTOMS	MANAGEMENT
Grade 1	aches after training only	treat and train normally
Grade 2	aches after training, stiff before training, (injury) warms up	treat and modify training remove aggravating factors
Grade 3	aches most of the time, (injury) doesn't warm up, athletic (dance) performance inhibited	treat and rest symptoms must sub side at least to Grade 2 (before resumption of training)

(b) The sprained ankle appears to be the most common sporting injury (Craig Purdam's survey of netball and basketball injuries at the Australian Institute of Sport). The incidence of injuries reported in several other surveys mentioned in his report showed sports ankle injury rates (29%-31%) which are somewhat higher than the incidence of recent dance ankle injury(23%)in this survey and remarkably similar to the rate of chronic dance ankle injury reported in this survey(29%).

The forms of effective treatment used were taping, engagement in a "wobble board" program and early intervention by informed staff. (A wobble board (Baps) is a bio-mechanical ankle platform system).

This type of information in the hands of dance educators/teachers is indispensable.

Comparison with British survey (Bowling 1989)

A response rate of 86% from full time professional dancers indicates the efficiency of the dance network established by A.A.D.E. In a smaller and less comprehensive survey, 74% of British dancers responded.

- Of the total Australian responses 44% were male and 56% were female (43% male and 57% female British)
- 86% of those responding in Australia were under 30 years of age, whereas only 53% of the British dancers were in this age group, indicative of a more youthful Australian professional dance population
- 56% of Australian dancers (42% British) had suffered an injury within the last six months (preceding return of the form)

The British dancers suffered fewer injuries during rehearsal than the Australians

- **Class**: Australians 15%, British 16%
- **Rehearsals:** Australians 42%, British 28%
- **Performance**: Australians 29%, British 32%

Body Mass Index (B.M.I.)

(Body Mass Index = weight over height squared)

In both studies the mean values for Body Mass Index were lower than the general population.

- 67% of all Australian female dancers showed a B.M.I. of less than 20.0 Most of the females in the British study had a B.M.I. of below 19.0

Discussion

The results of the Australian survey show an extensive level of injuries, both chronic and acute. Chronic injuries are first being suffered at pre-professional level when the dancers are young.

The results are a warning signal that needs to be heard, particularly by those creating or adapting training curricula or syllabuses for those in the early stages of training.

In the light of these findings it is apparent that a multi-disciplined panel needs to be involved in the writing of new, or adapting of old, syllabus material e.g. dance teachers, exercise physiologists, physiotherapists, developmental psychologists and specialists in motor development.

The number of dancers with such injuries at 18 years has increased by 23% with seven more years of professional work (see section headed Chronic Injuries).

The wastage of highly trained human resources demonstrated by this survey is no longer acceptable. The artistic and financial penalty to the art form is prohibitive.

The population responding to the survey is extremely youthful (86% under 30, only 5% over 35). The reasons for this are discussed by Beall in the Dancers' Transition Report (1989). Is this bias toward youth a reflection of a national failure to appreciate maturity and experience as desirable characteristics of the performing artist?

The frequency, site and types of injuries are remarkably and unexpectedly similar in both classical and contemporary groups, the difference being that dancers in the classical companies more often described the site of their spinal injury as "back",

whereas dancers in contemporary companies described the site of their spinal injuries by identifying the location along the spine. Perhaps this suggests that anatomical instruction is more specific in the contemporary dance teaching/choreographic process. However, this level of awareness does not seem to be providing protection from injury.

Consistent with a similar survey carried out in Britain, the back and lower limbs were shown to be particularly vulnerable to injury.

Chronic injury

The level of chronic injury (affecting ability to undertake normal workload) is unnacceptably high (65%) and the early age at which it occurs is untenable.

The most striking factor associated with chronic injury is that most dancers are already impaired by the age of 18.

Chronic injuries to dancers create human, artistic, and economic havoc in the industry.

Acute Injuries

The level of acute injury (56%) is similarly unacceptable.

The most common types of injury were torn and strained muscles and ligaments.

It is disturbing to see that 35% of the soft tissue injuries were not resolved - although sports physicians involved in dance in this country believe that with correct treatment the recovery rate for this type of injury should be much higher.

This may have a correlation with the fact that:

- 72% chose massage as treatment
- 43% chose manipulation
- 31% chose anti-inflammatory drugs

The use of these modes of treatment is questionable for acute soft tissue injuries.

After Injury

Although 90% answered that they knew how to treat an injury, they may still be using traditional methods based on folklore and myth. The management practices used by dancers need to be examined.

Unfortunately, dancers with an emotional commitment to superseded methods of injury management, perhaps learned from a highly respected source, may be more difficult to reach than dancers who openly admit to needing information.

Causes

Poor technique, perceived overwork and repetition are cited by dancers as causes of injury - all of which can be modified through improved work practices, education and training.

In view of the figure of 42% of injuries occurring during rehearsals, a review of rehearsal management practices by rehearsal directors, repetiteurs and choreographers is indicated.

Treatment

Satisfaction with the services provided by physiotherapists is shown to be of a high order. It appears that these professionals are providing advice acceptable to dancers.

Inclusion of experienced physiotherapists (with dance knowledge) in the design and delivery of courses in dance injury prevention and management is therefore extremely important. It is also important that the dance community provides opportunities for physiotherapists to enhance their knowledge of dance.

As only 20% of dancers used ice, it appears that knowledge of even simple treatments such as R.I.C.E.D. needs to be improved (see Chapter 5).

The female dancer

Results indicate an early start to intensive dance training for female dancers. This raises several issues of interest for further investigation.

1. There appears to be some level of relationship between intensity of early training, number of, and recovery time from, injury. This cannot be undervalued as a possible source of potential injury reduction.

2. Diversification of physical skills training, (such as fast walking, swimming, weight circuit training, bike riding - supplemented by appropriate stretching) is not widely accepted, particularly in female dance training. Investigation of its benefits (in terms of injury prevention and artistic expression) is warranted. The Australian Sports Commission recognises the advantages of diverse background training via its Aussie Sport program for juniors. Diversification brings the benefits of increased aerobic capacity and strength, also of advantage to the dancer.

3. The extensive level of amenorrhea and menstrual irregularities in female dancers need not be alarming if the effects of such conditions were better known. The issue of bone weakness in association with athletic amenorrhea is not comprehensively understood. It is suspected that females suffering from amenorrhea do not lay down sufficient bone, which can leave them open to stress fractures in the growing period and possible osteoporosis or sterility in later life.

Furthermore, poor diet, lifestyle management, exercise intensity at a young age and myths surrounding the cause of amenorrhoea cannot be overlooked as factors associated with injury.

Conclusion

The value of this study is that it supplies a unique source of information about the prevalence and

types of injuries occurring in a cross-section of professional dancers in Australia.

Many questions are posed that need specific attention e.g.:

- specificity of training (see Chapter 4)
- training hours
- injury recovery and management
- perceptions of pressure to return to work injured, etc.

This study establishes a national overview of injuries in the dance profession. There are many more facts to be gathered and much more research to be undertaken.

2. THE AUSTRALIAN DANCE ENVIRONMENT

Must we accept injuries and early retirement of dancers in Australia?

The Dancers' Transition Report by Catherine Beall (the joint Actors' Equity/AADE project in1989 which immediately preceded Safe Dance) provides a starting point, giving this project its place in a continuum of dance investigations.

The two points in the Dancers' Transition Report that had most relevance for the Safe Dance Project were:

- (i) the negative self images expressed by 68% of current dancers, when they indicated that they thought injury would be the most likely reason for retirement - a self-fulfilling prophecy given the average age of retirement

- (ii) the average age (between 25 and 30 years) at which the transition into retirement took place

In state-supported companies in other parts of the world (e.g. Europe, Scandinavia, U.S.S.R, Cuba and South America) dancers are accustomed to the concept of a minimum working life of 20 years (which they must complete in order to qualify for a state pension). However they work under conditions that make proper allowance for the possibilities of pregnancy or of sickness and injury as a normal part of their working life and the underlying expectation is of ultimate recovery and resumption of dancing.

Such a positive expectation could become part of the way in which economic supporters of the art form in Australia might extend some form of security to its practitioners, thus making an important contribution to extending the effective working life of the trained dancer in the industry.

Producing the next generation of dancers in the light of the new information provided by this research

will prove to be a new and exciting challenge for the dance educator and studio teacher.

Existing injury prevention initiatives

The companies

Some programs are being undertaken by companies in this area. Listed below are some of the initiatives:

- As the injury survey demonstrates, 14% of professional dancers sustain injuries during the first three weeks of work after a break (length unspecified in the questionnaire). This has already been noticed by the director of Tasdance, who has attempted to rectify this situation by introducing a graduated work load after the dancers have returned from recess.

- Sydney Dance Company has already held its own injury survey and seminar, in an attempt to take responsibility and reduce the rate of injuries.

- The Australian Ballet organises seminars for studio teachers in prevention and management of injuries, led by four experienced dance medicine specialists. The company is also conducting a longitudinal injury survey of its dancers, requiring all major and minor injuries to be reported. Dancers must now have a doctor's clearance to return to work. The company is trying to improve rehabilitation procedures and provides one-to-one classes for injured dancers. A Pilates practitioner has been appointed to assist rehabilitation. Lectures for dancers in life skills, money management, nutrition, etc. have been instituted. With regard to fatigue levels, rehearsals are now called according to need, and the traditional eight-hour blocks have been abolished.

- The West Australian Ballet belongs to the Life-Care program, and allocates work time at the gymnasium for the dancers in their company

who need strength training. A multi-disciplined team of doctors, physiotherapists and sports trainers looks after company members under a comprehensive program of injury prevention and management.

- The Meryl Tankard Company utilises Yoga training several times a week as an adjunct to training.

Precedents such as these need to be expanded upon and used as models by companies which have not yet tackled the problem.

The tertiary dance programs

(The details below have been supplied by the Institutions themselves upon request. The hours given refer to the total number covered in a course, unless otherwise specified).

- The Australian Ballet School, since its move to the new Centre shared with the Australian Ballet, has access to a fully equipped and professionally supervised gymnasium where daily training is available for both sexes in consultation with their dance teachers. Applied Anatomy classes (18 sessions over three years) are given, and formal lectures on Nutrition are also scheduled as required. Injury prevention and management are considered an integral part of daily technique training and of the special slow coaching classes. A ballet-trained physiotherapist has rooms on the premises, and a physician conducts weekly clinics and is available for diet consultations. A consultant orthopaedic surgeon maintains close liaison with the Director of the School. Counselling services are available at the Royal Children's Hospital when required.

- The Dance Department of Brisbane College of Advanced Education offers an Associate Diploma of Arts (A.D.A.) (two-year professional training course) and a Bachelor of Arts (B.A.) (three years) in Dance. Courses are scheduled

in Applied Anatomy (A.D.A. 63 hrs, B.A. 56 hrs), Injury Prevention (A.D.A. 56 hrs, B.A. 56 hrs) Nutrition (A.D.A. 2 hrs, B.A. 2 hrs) and Kinesiology (A.D.A. 21 hrs, B.A. 21 hrs). Students have weekly access to a physiotherapist to talk about injury management and prevention, and have regular discussions on Nutrition during their course of study. A two-week warm up period is scheduled before each academic year commences.

- The National Aboriginal/Islander Skills Development Association, within its Dance Certificate and Associate Diploma Courses (total five years), schedules 37.5 hrs in Applied Anatomy and 37.5 hrs in Nutrition. Injury Prevention and Management and Nutrition are covered by a course in Year 4 in Human Biology, 37.5 hrs.

- The Dance Department of the University of Western Sydney (Nepean) schedules a Year 1 Unit for its B.A. students entitled Anatomy and Biomechanics for Dancers. Dance teachers address anatomical information during technique classes, and Injury Prevention and Management are discussed with students whenever possible.

- The Dance Department of South Australian College of Advanced Education schedules a 30 hr unit in Applied Anatomy and Kinesiology for its B.A. students. Occupational Health and Safety is covered as part of the Performance and Production unit. Injury Prevention and Management are not scheduled as individual subjects but receive attention during technique classes. Students are required to attend visitors' lectures on Nutrition but are not assessed on the subject matter.

- The School of Dance of the Western Australian Academy of Performing Arts schedules a first year course in Applied Anatomy (1.5 - 2 hrs per week) and a second-year course in Kinesiology (1.5 - 2 hrs per week). Some Yoga is taught, and Injury Prevention and Management and Nutri-

tion are covered in the two-year course, although not taught as individual units.

- In the two-year Associate Diploma course in Dance Instruction and Management at Box Hill T.A.F.E., courses are scheduled in Applied Anatomy (10 hrs), Injury Prevention (10 hrs), Nutrition (4 hrs, plus wider reading), Kinesiology (10 hrs). A unit on Occupational Health and Safety (4 x 2 hrs) and a unit on First Aid for Dance Teachers (12 x 2 hrs) are included in the Dance Studio Management course.

- The School of Dance at the Victorian College of the Arts provides first-year students in its B.A. course (3 years) with a program consisting of Applied Anatomy (36 hrs), Injury Prevention (6 hrs), Injury Management (3 hrs), Nutrition (3 hrs) - a total of 48 hours. In addition, first-year students get 64 hours of Kinesiology, and second-year students get 32 hours. During their Classical Theory classes (32 hrs) first-year students are given a program exploring the most economical and safest use of the human body within the classical framework.

- The Rusden Dance Department of the Victoria College offers a four-year Bachelor of Education degree. Applied Anatomy accounts for 15 hours of the graduating students' course, and another 15 hours is devoted to Kinesiology studies. It is hoped to initiate some research into Nutrition by the students in conjunction with the Home Economics Department at Rusden, and with Dance Medicine Australia, a Victorian performing arts treatment and rehabilitation centre.

- The Centre for Performing Arts in Adelaide offers a three-year diploma, giving 100 hours total over the whole period in Applied Anatomy, Kinesiology, Injury Prevention, and Management and Nutrition. First-year students also have 12 hours in Health and Safety.

Existing rehabilitation methods

The Kathryn and Gilbert Miller Health Care Institute for Performing Artists in New York is one model for the diversified treatment and rehabilitation of performing artists, allowing for an eclectic approach from a multi-disciplined staff. It provides affordable care to those whose livelihood depends on their ability to perform. It is affiliated with over 40 programs and specialties, for example orthopaedics, internal medicine, rehabilitation, stress management, substance abuse, A.I.D.S. treatment, metabolism and nutrition, and psychiatry.

In 1989 when Craig Phillips presented his paper for the AADE National Biennal Conference, "Dance medicine in Australia - where is it going?", he said that "until now there have been pockets of interest in dance medicine in this country, but no co-ordinated approach by health professionals" (Conference Papers, p. 39).

This picture is slowly changing.

Access to professional assistance (dance clinics)

The Australia Council recognised the need in this sphere in 1989 when approached by Craig Phillips (physiotherapist and former professional dancer) for a grant to study methods of rehabilitation overseas.

One of the results is Dance Medicine Australia (Melbourne), a performing arts treatment and rehabilitation centre (Director, Craig Phillips) utilising a combination of traditional physiotherapy and the Pilates Method (see Appendix 3 for a description of this and other body therapies).

Another model is now established at The MacDonald College, (Sydney), called "Body Sculpture" at which Reall Isacowitz (Pilates practitioner) is also utilising the Pilates Method.

In Adelaide, Ron Smith (physiotherapist and Feldenkrais practitioner) and Nicole Vass

(physiotherapist and former professional dancer, also responsible for a video entitled *Ballet Floor Barre*) are creating an oasis for injured dancers.

Open lectures on injury prevention and management, under the auspices of the Australian Ballet, have been given by Dr Ken Crichton (sports physician), Greg Schneider (physiotherapist and manipulative therapist), Ronald Quirk (orthopaedic surgeon) and Sarah Way (physiotherapist and former dancer) in Sydney and Melbourne.

In Canberra the Sports Medicine Clinic of the Australian Institute of Sport has, on occasion, made treatment available to injured dancers from visiting companies.

Although there are no dedicated dance medicine clinics in Brisbane or Perth, these were the cities where physiotherapists and physicians attended Safe Dance seminars in the greatest numbers.

A national contribution in this area has been made by Ronald Quirk, F.R.C.S., F.R.A.C.S. (Consultant to the Australian Ballet) who has written a series of articles on dance injuries for Dance Australia.

Discussion

During the period of the Safe Dance project it has been found that the dance community was already in possession of much of the knowledge needed to solve the problems of excessive injuries and the high attrition rates within the industry. One of the bonus achievements of the Safe Dance Project has been in bringing dance people together and facilitating the exchange of accumulated but diverse knowledge.

This brief overview of existing initiatives shows that there is a strong basis already for the development of future strategies for injury prevention and management.

Reducing dance injuries in Australia

In examining the possible causes of injury, consideration must be given to the psychological and physical status of dancers, the training they undergo, the conditions of their employment and the physical facilities in which they are required to dance.

Questionnaire responses attributing 26% of injuries to overwork, repetition and fatigue support the notion that some dancers may spend too much time practising dance technique with less than optimal concentration and inadequate self-correction. This may, understandably, be a product of fatigue and/or nagging injuries, or, more seriously, a failure to assume personal responsibility for refinement of technique in the absence of the teacher/trainer's attention. Whatever the cause, taking class in this way leaves the dancer vulnerable to injury.

This indicates a field for further research into levels of strength and fatigue and their possible fluctuation during a dance class

Discussion

As 52% of Australian professional dancers have their first chronic injury by the age of 18 years, it is logical to look for some of the initiating factors both in the training and in the education of dancers at all levels. Further research should be undertaken in these important areas.

Injury management courses made available to dancers, dance teachers and dance educators would have an impact on the present and future generations.

Although much of this subject area is now common knowledge to the present school-going generation through sport and recreation, it is comparatively new to the school curriculum and was not available

to many of the dance performers or teachers of today during their education. However, Australia now has a generation of tertiary graduates with more substantial knowledge.

Information and structured courses on injury prevention should be included in the curriculum for dancers, choreographers, dance teachers and dance educators. It is of paramount importance that these courses are made available to studio teachers and teachers of primary, secondary and tertiary dance students.

Although dancers spend many hours practising dance technique, thereby exposing themselves to the risk of repetitive injury syndrome, or accumulative creep injuries, there is no general recognition or consciousness of the value of such concepts as "relative rest" that are now accepted in other areas of physical endeavour.

The concept of "relative rest" is based on resting the injured part while continuing to exercise other parts. Many dancers make the assumption that the training of one particular set of movements exclusively will lead to muscle imbalance.

Muscle imbalance can be rectified by engaging in varied forms of physical activity. In the case of dancers, modified barre, fast walking, floor barre, swimming, pool barre, cycling (supplemented by appropriate stretching), weight circuit training and specific exercises are some of the activities available. In addition rehabilitation techniques such as Pilates and other body therapies can be used as adjuncts to recovery.

Some of these activities also contribute to aerobic conditioning, thereby exercising a positive effect on body composition (reducing the ratio of adipose (fat) tissue to lean muscle), which enhances the physical performance level and lowers the health risk of the individual.

Although the Body Mass Index of a large percentage of professional dancers is below what is considered normal for the general population, it is

suspected that they have more adipose (fat) tissue and less lean muscle than other élite athletes.

An attempt was made to test this hypothesis in a pilot project on body composition recently carried out at the Australian Institute of Sport by physiologists Deborah Kerr and Pip Pang. They compared élite student dancers from the National Capital Ballet School with élite gymnasts of the same age, height and body measurements (although the hours spent in training by each group were not compared). The sample was too small to be statistically relevant. However, further studies of this kind (with fewer variables) could give useful information.

Combined body awareness and fitness training may provide some of the answers to the prevention of injury.

What is available in the field of Body Awareness

There is a plethora of approaches and systems that has been developed over the centuries. Many of these now have exponents practising in Australia and a few are already working in the field of dance.

Appendix 1 provides a combined list extrapolated from the writing of B.Jencks 1 (Table 6 Page 56) and S.Fitt 2 (Table 17.1 Page 296). This is not intended to cover the subject completely, but to offer a glimpse of what is available and a brief description of the content as interpreted by these authors.

Of these techniques there are at least five gaining acknowledgement in the field of dance in Australia as adjuncts to training and/or rehabilitation techniques: Pilates Method, Alexander Technique, Feldenkrais, Ideokinesis (Sweigard) and Yoga.

When practised diligently with a competent instructor all of these techniques have in common the ability to enhance:

- kinaesthetic awareness:
  body awareness, alignment

- neuromuscular coordination:
  balance, agility

Pilates, Feldenkrais, Yoga and Alexander also offer increased flexibility (static/dynamic)

Pilates and Yoga can also build strength

The component of conditioning that is lacking in these techniques is **cardiovascular endurance** (See discussions in Appendices 1b and 1f).

What is available in the field of Fitness Testing

Some dance science research has indicated that dance training is an anaerobic activity even though there is a certain amount of transfer from one activity to another (*Science of Dance Training*, Clarkson and Skrinnar, p 95).

However rehearsals (in which 42% of injuries occur) and many performances (during which 16% of injuries occur) do require a degree of fitness to withstand the long hours (fatigue) and new techniques (strength).

The Department of Arts, Sport, the Environment, Tourism and Territories offers a booklet and video, both entitled: *Fitness Testing - A Guide* - available upon request from the Director, Fitness and Safety Section of DASETT, Tobruk House, Moore St, Canberra City ACT 2601.

Of the 14 points outlined in appendix D. of this booklet, there are some that use relatively sophisticated equipment. This equipment is usually to be found in the local gymnasium.

This package needs no adaptation for dance as it is written in general terms for Arts and Sport.

What is available in the field of Dance Science

In the field of dance kinesiology and dance science there are two informative books, available through

Human Kinetics Publishers (Australia), both of which are appropriate text books for dance studies.

- *Dance Kinesiology* by S.Fitt
- *Science of Dance Training* by Clarkson & Skrinnar

These books, published in 1988, contain much of what is presently available in up-to-date research, and are written specifically for dance educators and dancers.

Osbourne, in her paper 'Towards Safer Dance Training' published in the *AADE National Biennial Conference Papers* (1989) offers information and guidelines. Particularly useful are her 'Safe Alternatives to Questionable Exercises' (p. 32).

What is available in the field of Physical Education

Most gymnasiums have a notice board which prominently displays a selection of the following:

- recommendation for a physical checkup before increasing work loads
- injury prevention information
- injury management information
- stretching techniques
- heart rate charts
- advice on the type of footwear most suitable to the activity involved
- anatomy charts

With the possible exception of anatomy charts, this type of information is rarely displayed in dance studios, dance company rehearsal rooms, secondary or tertiary dance education institutions.

Some of these subjects are taught and encouraged in some studios and institutions. However there is a need for an integrated approach that clearly demonstrates the dance teachers'/educators' commitment to the evolution of dance science both in the classroom and the studio. In this context it is appropriate to refer to the Code of Ethics developed by studio teachers and the A.A.D.E. (see Appendix 5).

There is a fast developing volume of available material in the area of physical education that is readily adaptable to the needs of the Australian dance community.

The Australian Coaching Accreditation (A.C.C.) Scheme has produced a coaching manual for its Level 2 course covering the sports sciences and their application to coaching. This manual is entitled *Towards Better Coaching. The Art and Science of Sports Coaching*, edited by Frank S. Pyke, Ph.D. The collection of articles, written by eminent authorities in a variety of fields relating to sport, gives an idea of the possibilities in the sphere of dance.

Wellness Australia Pty. Ltd., a Perth-based health and fitness education, product development and consulting company, has published a booklet entitled *Exercise Danger* describing 30 exercises to avoid, plus 100 safer and more effective alternatives. On page 4 is a statement of "Safety Principles" applying equally to dance education and training.

Sports Injury Prevention Program's (S.I.P.P.) basic course published and distributed by Cumberland College of Health Sciences and Footscray Institute of Technology offers an innovative program which could be utilised as a model for a similar dance injury prevention program.

Can existing material be adapted?

Although the dance books suggested in this study are well researched and contain relevant information, it is not reduced, codified, compartmentalized

and itemised for direct use in short courses, as such information has been in the field of physical education.

While much can be adapted, some of the information offered in the physical education material for injury prevention courses is not relevant to dance.

For example S.I.P.P.'s basic course considers eight main areas of prevention. The physical, psychological and social characteristics of the first four areas are appropriate to dance:

- Personal Health and Hygiene
- Fitness and Conditioning
- Warm-up and Cool-down
- Overuse Injuries

These could be used with very little adaptation.

However the environment, technique training and exposure (type of dance, time spent dancing, intention of dancing) are different and would have to be reworked.

- Technique
- Rules and Regulations
- Environment
- Personal Sports Equipment

What is available in the field of Psychology

This is an area of great importance that could provide valuable support to the dance community.

There are already in existence sophisticated methods for identification of, and coping with, both positive and negative stress. These have been refined in the area of sports psychology during the

last decade and would require little adaptation for dance needs.

Indeed, some dancers are already in possession of a number of these skills and use them very effectively. However the characteristically non-verbal nature of dance can often leave these skills unarticulated.

The same observation can be made concerning dance teachers/trainers. It would be of value, therefore, to research and codify the strategies already evolved by individuals as a means of coping with challenge in the dance environment

Following is a theoretical framework freely adapted from a sports psychology model.

COUNSELLING
DANCEPSYCHOLOGY

Performance Enhancement Skills	Clinical Issues
Psychological skills	Self esteem / confidence
Attitude	Reaction to social dislocation
Concentration	Stress of injuries
Self talk / images	Eating disorders
Stress management / life balance	Substance abuse
Emotional control	General life balance
Management routines	Emotional balance
	Assertiveness

Performance enhancement - awareness

- Performance enhancement techniques are now quite common practice elsewhere for some teachers/coaches when preparing dancers for the rigours and stresses of international competitions.

- A mood/behaviour profile can be made to ascertain the optimal level of performance for the individual dancer. One model is the "inverted U" hypothesis, explained by Brent S. Rushall in *Towards Better Coaching*, (Chapter 7).

Attitudes

- In dance classes, the teacher defines the content and controls the majority of conditions under which the class is taught. The teacher also makes value judgments on what is aesthetic and appropriate, and decides when and where the students move.

- This authoritarian style used to teach technique, needs to be balanced by an awareness of psychological needs of the individual being taught.

Management routines

- Life and career management routines for the professional dancer are skills usually acquired, if at all, during the learning process as part of a master/pupil relationship. However, by formalising and codifying these skills we can minimise the emotional content and maximise the practical accumulation of knowledge.

Stress management - life balance

The observable progression from staleness to overtraining to overuse injuries, has both physiological and psychological aspects.

- Dancers' concern about not being able to train fully because of injury is itself a stress factor, contributing as much to the situation as the actual injury.

- The lack of confidence in their own ability to perform when they do not consider themselves to be at optimal level creates worry and fear which is psychologically and physiologically debilitating.

Psychological skills

- The transitions into, within, and from dance - from injury to injury recovery - could be accomplished with fewer traumas if more use were made of the support available from this area of competence, such as counselling.

Clinical Issues

Clinical issues such as "self esteem/confidence" are clearly relevant when one considers that:

- 35% of injured dancers are "uncertain of, or do not anticipate full recovery" from soft tissue injuries

- the expected retirement age for Australian dancers, dancing in Australia, is between 25 and 30 years of age. *(Dancers' Transition Report,* Beall 1989).

Eating disorders

- The eating habits disclosed by the injury survey, in conjunction with the menstrual irregularities disclosed by female dancers, indicate the need for further investigation. (A more detailed discussion appears in Appendix 1c, of this report).

Reaction to social dislocation

- This covers a multitude of situations - from relocation, isolation, injury - to promotion or retirement etc. (as Beall's 1989 *Dancers Transition Report* so clearly pointed out).

Life balance

- Achieving a "life balance" by diversifying the personal focus to include academic and physical skills (both within and outside dance training) expands the mind and develops breadth in the artist.

Assertiveness

- This appears to be an issue when 57% of injured dancers "carry on as best they can" and do not rest or seek immediate professional assistance after suffering an injury.

The area of dance psychology requires further research and study, and is by no means covered here. However the above comments may help to re-assess and improve ideas on "how we want the body to function" (Karin, 'The needs of studio teachers from the Safe Dance Project' *AADE National Biennial Conference Papers 1989).* See also Adie 'Humanising the Education of the Dancer', *Report of the Meeting Between the National Council of Tertiary Dance Directors and the Artistic Directors of Australian Dance Companies, 1989.)*

Discussion

In an interview with the leader of one of the most prestigious dance training institutions in this country, the radical view was expressed that counsellors created the problems, which is tantamount to saying that the "greenies" created environmental pollution.

The testimony of this injury survey indicates that the problems exist in dance training itself.

Psychology may constitute one of the building blocks that can restore balance to the structure of dance education.

4. DANCE INJURY PREVENTION AND MANAGEMENT

The physical content of the dance training :

The Warm up

What is commonly referred to as "warm-up" before a dance class usually omits a cardio-vascular endurance component. This is not a problem in itself as the well constructed dance class begins slowly, builds to a maximum work load and warms down.

However this same warm-up is **not** sufficient before a rehearsal that requires maximum work load (where 42% of injuries occur). This is the time a warm-up with a cardio-vascular component is needed.

The process referred to as "warm-up" happens "within 10 minutes of the movement's beginning and is almost completely gone 30 minutes after the movement is completed. This makes it clear that if you have a 30 minute break you must warm up again." (Geeves, 'The difference between being warm and warming up' Appendix 1a)

- **A complete warm-up is always necessary before dancing full out.**

The grand plié

Is the *grand plié* (deep squat) the dinosaur of dance?

With the exception of *grand plié* in second position, (which is still utilised in both contemporary and classical technique, and is not potentially dangerous) this manoeuvre is rarely seen any longer in the classical repertoire. The exceptions that prove the rule must be the *grand plié* in first position in the male variation of Bournonville's third act of *Napoli*, and the female who opens Lander's *Études* with grand plié in fourth position.

Osbourne ('Towards safer dance training' *AADE National Biennial Conference Papers 1989*) states that grand plié is an inefficient movement and points out that "pressure on the knee joint increases seven times beyond 90°", then suggests a safe alternative, the *demi plié* (half squat). In addition, as dancers get older, the cartilage degenerates, becoming more brittle, and making the knee more prone to injury.

As the dance teacher's function is to facilitate the acquisition of technique required by the choreographer, the days of *grand pliés* (in first, third, fourth with lifted heels, and fifth positions) in class are numbered, thereby reducing stress on the knee, a particularly susceptible part of the dancer's instrument (13% of recent injuries, 15% of chronic injuries).

- **Abandon *grand pliés* (in first, third, fourth, with lifted heels, and fifth position) in training.**

Specificity

This leads to the question of specificity, (15% of the injured dancers reported that they "were not used to a particular technique at the time of injury").

Dance teachers must be adaptable enough to vary the content of their classes to prepare the dancer for a specific task or technique about to be undertaken in the rehearsal immediately following.

It is the artistic director's responsibility to alert the teacher/instructor to the content most suited to the needs of the moment.

- **Warm-up with the appropriate technique before rehearsal.**

Ankles and feet

A large percentage of the injuries incurred (29%) were to ankles and feet (see discussion in Chapter 1 - Comparison with sports injuries).

- **Use a "wobble board" and elastic muscle toners for the feet and ankles, regularly.**

Backs

- 34% of injuries were spinal.

- A research project entitled "Can we prevent back injuries to élite women gymnasts?" was conducted by Dr Peter Fricker and Julian Colby (Sports Science & Medicine Quarterly, Vol. 1, No. 1, June 1984). The back injury rate for élite female gymnasts during the first year of the project was 32.3% of all injuries. During the second year, this rate dropped to 25.6%. The overall effect of the program was to reduce the proportion of severe back injuries and shift the severity towards the mild grade.

- A system of regular back exercises was developed in this project which has had a measurable effect. This method has been further refined by experience over the last six years at the A.I.S. Sports Medicine Centre. It consists of four stretching exercises and eight strengthening exercises as part of the warm-up. The research paper is available from the A.I.S. Library, Bruce, A.C.T.

- Strengthening exercises producing overload in the abdominal muscles and back extensors should benefit both men and women dancers. Repetition builds endurance, while overload builds strength. Some stretching exercises are a normal part of dance training, however it is necessary to keep abreast of new developments (See Atler, J. *Science of Stretching*).

Selection of the dancer

Those selecting dancers for pre-professional training must bear in mind that all systems of the body are interrelated - one affects the other - just as each system is affected by physical or mechanical stresses, chemical or biological reactions, social or psychological pressures.

Tertiary dance institutions and dance companies traditionally hold auditions where the student dancers are evaluated (for technique, alignment, flexibility, strength, power, musicality and aesthetics) by a multi-disciplined panel.

- **For the protection of the dancer's future, the reputation of the teacher, institute or company, these testing protocols need to be codified and extended to include all components of conditioning.**

Physical capacity profile for pre-professional training

Components Of Conditioning:
(Full descriptions of the components of conditioning appear in *Dance Science* (Clarkson and Skrinar), *Dance Kinesiology* (Fitt) and *Towards Better Coaching* (Australian Coaching Council) (see Bibliography).

- Flexibility
  (static and dynamic)
- Strength
- Power
- Muscular endurance
- Neuro-muscular co-ordination
  (balance, agility, kinaesthetic awareness)
- Cardio-vascular endurance
- Body composition
- Somatotyping
  (body typing)

(Somatotyping in particular would enable the informed panelist to evaluate which training program would most benefit the individual. Somatotyping looks at the individual's shape, composition, physiology, movement capabilities and limitations).

(see W.H. Sheldon, *Atlas of Man*, Harper & Row, New York - refined in 1979 by Heath & Carter).

- **The physical capacity profile documented would then be available for both dancer and teacher to monitor the effect of training and lifestyle, and facilitate the planning of suitable modifications for the individual's training program.**

The psychology of dance teaching

Although the questions in the injury survey were predominantly concerned with physiology, there are answers (e.g. too early return to work, continuing to work on chronic injuries) that indicate some dancers suffer from a distorted body image and low self esteem which can provoke psychosomatic injury. This is supported by responses to the *Dancers' Transition Report*. (Beall 1989).

The role and behaviour of the educator and sports coach is the subject of a wide range of literature. However the role and behaviour of the dance teacher/educator was relatively unresearched until 1970. The bibliography of Gray's book *Dance Instruction* lists current research in this area.

The article in Appendix 1e offers some indicators that could be used to analyse teaching and stimulate discussion.

Dance teaching is becoming a science as well as an art where a knowledge of dance technique and performance, coupled with the principles of exercise physiology and kinesiology, form a framework, supported on a firm base of injury prevention and management.

Dance teaching can be approached analytically, intuitively or with a combination of the two. If one is gifted in one of these approaches, some insight into the other would create a more balanced perspective.

When teachers have identified their personal teaching approaches, they may find elements that can be adapted or changed. They may wish to introduce new elements in teaching or may find that the present approach is professionally appropriate and personally satisfying. (An examination of this strategy is to be found in Judith Gray's *Dance Instruction,* published by Human Kinetics, Australia, 1989).

The teacher needs to employ self analysis in order to become aware of, and evaluate, personal strategies for facilitating the student's learning process. (Stinson, *daCi Dance Papers and Proceedings,* Auckland 1985 has a noteworthy insight into this process).

Following are some of the traditional types of dance teaching behaviour to avoid:

- Non teaching - punishes, presents personal point of view, tells jokes, etc.
- Counter teaching - sarcasm, criticism of a personal nature, expresses disappointment or frustration (e.g. frowns, shakes head)
- "Taming" rather than training of the student produces the responses expected by the teacher, but can impair the ability of the students to make their own decisions, to understand the requirements of their own bodies and to develop self discipline

Training based on trust and two-way communication develops self-discipline.

- **The development of dancers who are less vulnerable to injury and open to healthy recovery, needs teachers who can inculcate confidence, self reliance, self-awareness and responsibility in their students**

(Notes on the teaching environment and facilities appear in Chapter 5, pp. 46-48).

5. SUGGESTED CURRICULUM FRAMEWORK

One of the goals of this project is the production of an injury prevention curriculum which can be used in the design of short courses for studio teachers and dance movement specialists. The following framework provides guidelines for the production of such curricula.

Studio teachers and dance movement specialists

Course content

- Course introduction: covering both the limitations and the expectations of the course
- Functional anatomy and human performance
- Mechanics of movement
- Potentially dangerous exercises and safe alternatives
- Prevention, recognition and treatment of common dance injuries
- Physiological support system:
  Exercise physiology
  Components of conditioning
  Somatotyping (Body types - see Sheldon *Atlas of Man*, 1954)
- Nutrition
- Movement analysis
- Dance, exercise and weight management
- Relaxation and stress management techniques
- Teaching method
  Styles, characteristics and behaviours
  Knowledge, communication, organisation
  mobility, proximity, etc.

Delivery of the courses

Short courses (one unit= 2 hours) in the form of open learning packages provide an appropriate method of delivery. Organisation and timing of these would recognise the commitments of studio teachers.

Each course should consist of:

- aims and objectives
- content
- learning experience(s)
- evaluation
- references and reading material.

Teaching of the courses

These courses should be delivered by personnel with the necessary level of qualifications to enable the recipient to add these credits to an appropriate tertiary education package at a later date if desired. They should therefore be academically compatible with existing course objectives and standards.

Location of the courses

The courses could be delivered through T.A.F.E. Institutions, colleges or universities.

Outcome of the courses

These open learning packages could be validated by registration in a "passbook" , a proposed document in which short-course certificates could be accumulated toward an eventual diploma or similar recognition of achievement.

As an incentive to teachers to complete these units, this system could later be coupled to the Safe Dance insurance scheme, units being equated with premium reductions, for example.

Pre-professional training at secondary, post secondary and tertiary levels

It has been established that 52% of Australian professional dancers have already suffered their first chronic injury by the age of 18 years. As no background figures on adolescent dance training injuries in this country are available, it seems advisable to implement a program that will prepare and repair the professional student for a full work load.

Proposals

On entering a secondary, post secondary or tertiary institution, the students should be tested for all **components of conditioning** to enable the educators to record **a physical capacity profile for pre-professional training,** on the basis of which they can be provided with **a program that will prepare them for the work load** of a full time dance course (see Chapter 4 - Selection of the dancer, and Appendix 1f - paper entitled 'The Selection Process').

Whilst students are attaining an appropriate level of fitness and strength, the curriculum should provide **a body awareness course** (i.e. Feldenkrais, Alexander, Pilates, Yoga, Ideokinetic Facilitation, etc.) in order to recreate an awareness of alignment, through neuromuscular repatterning. This would allow each student to kinesthetically recall their own particular cultural patterning, as opposed to the patterning of the dance techniques in which they are specialising.

In the interim period of approximately six weeks, (depending on individual body type) whilst the student is developing awareness through renewed body experience and preparing a body fit and strong enough to tolerate a full work load of dance technique classes, the student needs to be exposed to **visual and audio resources** as an adjunctive learning process in order to maintain dance technique.

The students also need to acquire **a verbal language** (e.g. Kinetic Sensory Studies or Labanalysis) with which to identify and describe movement.

A course in **Injury prevention and management**, including functional anatomy and nutrition courses should be mandatory, during this first semester at least, and taught by qualified specialists.

- Some of these units are being taught at some of the schools and institutions (see Chapter 2) some of the time (and are included in some of the graded dance syllabuses).

- **This proposal is for all of these units to be taught everywhere in a particular order at the beginning of the pre-professional dance education process.**

A pilot project on the following lines could be established for a trial period, in order to establish the success or otherwise of this approach to prevention of injury.

- **The intention of this course is to prepare and repair the body for intensive technique classes, which have no part in this preliminary process.**

The selection process

- Audition
- Testing protocols for all components of conditioning
- Construction of a physical capacity profile
- Construction of a movement profile

Course content

- Body awareness
- Introduction to body therapies

- Visual and audio training in dance technique
- Training in verbal description of movement
- Injury prevention
- Injury management

Outcome of the courses

Development of a strong, aware dancer, able to tolerate a full workload when re-entering technique classes.

Environment

Now that dance has become a part of education in schools the legal requirements of the "workplaces" (studios) under the Occupational Health, Safety and Welfare Act (1986) must comply with the legislation and regulations thereunder.

The guidelines are intended to cover the essential and important points in common performing arts practice and are easily adapted to dance in particular, perhaps providing protection for the ballet studios from future litigation.

Facilities

Practical dance should be taught indoors in a spacious, well-ventilated and well-lit studio/activity room. The space available (including the height of the ceiling) should be adequate to avoid collisions.

A sprung wooden floor is highly recommended. If an area which has a concrete surface is used, appropriate footwear and suitable floor surface or covering is essential.

- **Advanced levels of technique must not be taught on a concrete base.**

There should be change rooms and shower adjacent to the studio.

Mirrors used in dance studios for correction of technique must be shatter proof and professionally installed.

A first aid kit should be provided, which is fully stocked with instructions for the procedures referred to as R.I.C.E.D (see below).

R.I.C.E.D.

Rest:

- Injured tissue must have a period of rest. (57% of professional dancers responding to the survey stated that they carried on as best they could after injury)

Ice :

- Ten minutes is frequently better than one long application. (Only 20% used ice as treatment, but 58% of recent injuries were muscle /tendon /ligament and joint tears and sprains which could have benefited from the use of R.I.C.E.D.)

Compression:

- Moderately firm bandage to control swelling.

Elevation:

- Elevate the injured body part to help drainage.

Diagnosis:

- Get a professional opinion as soon as possible.

Only 10% of the injured dancers answered that they did not know what to do with an injury, yet 72% had massage as treatment - a questionable treatment mode for soft tissue injuries (See Chapter 1, discussion: Acute injuries). This suggests that there is a disparity between folklore and fact.

H.A.R.M.

Avoid any of the H.A.R.M. factors.

Heat: increases swelling.

Alcohol: increases swelling.

Running/dancing: too soon aggravates the injury.

Massage: in the first 24 hours increases swelling and bleeding.

Code of Ethics

The Australian Association for Dance Education (A.A.D.E.) has spent some years working with leaders of the studio teaching profession in developing a broad-based Code of Ethics for Studio Teachers (given in full in Appendix 5). Included in this project report are several focal points that could be utilised in the planned further evolution of the Code.

6. RECOMMENDATIONS

In order to take advantage of the developments in dance science and allied areas (particularly injury prevention), and the new information resulting from the Professional Dancers' Injury Survey, the following recommendations are made:

General recommendations

1. Establish a program of further research in dance (in association with A.A.D.E., N.A.I.T.C. and other relevant organisations) to pursue the recommendations below.

2. Develop (in consultation with a multi-disciplined advisory panel) a series of graded study modules in injury prevention and management, to formulate an Australian curriculum for distribution to dance practitioners throughout Australia.

3. Establish a pilot project for evaluation of the core curriculum.

4. Establish an accreditation scheme for course participants.

5. Produce dance-orientated audio-visual resources relating to injury prevention and management for use in the courses and for the assistance of teachers working in isolated areas.

6. Produce (or adapt existing) visual resources for display in studios, such as charts and diagrams for: (i)) recommendation for a physical checkup before increasing work loads, (ii) injury prevention information, (iii) injury management information, (iv) stretching techniques, (v) heart rate charts, (vi) anatomy charts, (vii) nutrition charts, etc.

7. Continue and develop the professional dancers' injury survey at intervals of approximately five years in order to monitor the effects of improved education in injury prevention and management.

8. Make available in all studios a first aid kit which is fully stocked and includes instructions for the procedures referred to as R.I.C.E.D.

9. Define and make available in all studios simple rehabilitation tools which may benefit prevention of injury, e.g. a "wobble board " (BAPS) for the feet and ankles.

10. Encourage the display of available information on anatomy, injury prevention and management.

Education and Training

11. Undertake a comprehensive survey relating to injury in adolescents in training.

12. Undertake a pre-professional dancers' survey every three years, in two groups - (a) up to 13 years and (b) 13 - 18 years.

13. Investigate the diversification of supplementary training for dancers, based on the concept of "relative rest".

14. Establish a pilot 20 hours introductory course covering injury prevention and management (including nutrition and substance abuse) for pre-professional students.

15. Establish a pilot course for studio teachers (at a training institution) covering areas of injury prevention and management, and follow-up evaluation of this course.

16. Encourage research in dance science, particularly dance psychology.

17. Identify and review selection/audition practices for admission to pre-professional training.

The workplace

18. Encourage companies to review rehearsal management practices in the workplace - especially regarding specificity of training.

19. Research the life management practices of dancers. Investigate existing strategies for coping with injury and rehabilitation.

20. Provide occupational health and safety programs for staff, dancers and choreographers.

Health professions

21. Undertake further studies into the injurious aspects of dance, including dance training and fatigue, body composition, nutritional aspects, psychological aspects, initial selection of professional dancers, environmental factors, choreography and its relationship to injury.

22. Undertake research into methods of more efficient rehabilitation.

23. Undertake further research into adolescent injury with special attention focused on overuse and overtraining.

BIBLIOGRAPHY

A.A.D.E. *National Biennial Conference Papers, 1989.*

A.A.D.E. *Report of the Meeting Between the National Council of Tertiary Dance Directors and the Artistic Directors of Australian Dance Companies, 1989.*

ATLER, MICHAEL J. *Science of Stretching.* Human Kinetic Books (Aust), 1988.

ARNHEIM, DANIEL D. *Dance Injuries. Their Prevention and Care.* Dance Books, London, 1986.

ASTRAND, P. & RODAHL, K. *Textbook of Work Physiology.* McGraw-Hill, 1986.

BEALL, CATHERINE. *Dancers' Transition Report.* Actors Equity of Australia and the Australian Association for Dance Education, 1989.

BENNET, A.F. 'Thermal Dependence of Muscle Function'. *American Journal of Physiology.* 1984, pp. 217-229, 247.

BOTSMAN, P. B. *Review of Arts Education and Training.* Australian Government Publishing Service, Canberra, 1985.

BUSWELL, J. 'The A.B.C. of Body Care'. *Dance - The New Zealand Experience.* Papers and Proceedings, Dance and the Child International Conference, Auckland, 1985.

CAMERON, H. and KENDALL, D. *Kinetic Sensory Studies; a movement program for children.* The Aldine Press, Melbourne, 1986.

CAMERON, N. *Personality Development and Psycho- pathology.* Houghton Miffin Company, Boston, 1963.

CLARKSON, P. M. & SKRINNAR, M. *Science of Dance Training.* Human Kinetics Books, 1988.

CULBERG, J. *Dynamisk Psykiatri.* Natur och Kultur Sweden, 1984.

DANCE & THE CHILD INTERNATIONAL. *Dance - The New Zealand Experience.* 1985 Papers and Proceedings, Auckland N.Z.

Dance Dialogue, a Strategy for the Development of Dance in Western Australia. Department for the Arts, Government of Western Australia, 1989.

DELL, CECILY. *A Primer for Movement Description.* Dance Notation Bureau Press, New York, 1977.

Exercise Danger. Wellness Australia Pty. Ltd., 1988.

FELDENKRAIS, MOSHE. *Awareness Through Movement.* Harper & Row, New York, 1972.

Fitness Testing - a Guide. Fitness and Safety Section, Department of the Arts, Sport, the Environment, Tourism and Territories. Australian Government Publishing Service, 1988.

Fitness Leader Certificate Course. Tasmanian Institute of Technology, 1988.

Fitness Leader Certificate Course. University of Tasmania, 1989.

FITT, SALLY SEVEY. *Dance Kinesiology.* Schirmer Books, New York, 1988.

GRAY, JUDITH A. *Dance Instruction.* Human Kinetics Pub. (Aust), 1989.

HAYWOOD, KATHLEEN M. *Life Span Motor Development* . p4, Human Kinetics Pub.Inc., 1986.

HIX, CHARLES. *Working Out.* Simon & Schuster, Inc., New York, 1984.

JENCKS, BEATA. *Your Body Biofeedback at its Best.* Nelson Hall, Chicago, 1977.

KESTENBERG AND SOSSIN. *The Role of Movement Patterns in Development* . Dance Notation Bureau Press, New York, 1979.

KUBLER-ROSS, E. *On Death and Dying*. Collier Books, Macmillan Pub. Co., New York, 1970.

LEVENKRON, S. *Anorexia Nervosa*.Natur och Kultur, Sweden, 1986.

LINSDTROM/PERSON/RUTH/SVENSTAM. *The Working Environment of Theatre and its Future Development*. P.U. Lunds University, Sweden, 1987.

Needs and Functions of a National Dance Research Centre. Department of English, University College, Australian Defence Force Academy,1988.

PARK, GLEN. *The Art of Changing*. Ashgrove Press, Bath, 1989.

MAHLER, M. BARNETS. *Psykista Fodelse*. Natur och Kultur, Sweden, 1984.

MARTYN, LAUREL. *Let them Dance*. Dance Books Ltd., London, 1985.

MINTON, SANDRA CERNY. *Body & Self*. Human Kinetics Inc. (Aust), 1989.

QUIRK, R. Series of Articles on Dance Injuries. *Dance Australia*.

REYNEKE, DREAS. 'The Baps Board'. *Dancing Times*, August 1988, p1035.

RYAN, ALAN J., M.D. & STEPHENS, ROBERT E., Ph.D. *The Dancer's Complete Guide to Healthcare and a Long Career*. Bonus Books, Chicago, 1988.

SHELDON, W. A. *Atlas of Man*. Harper & Row, New York, 1954.

SHELL, CAROLINE G.*The Dancer as Athlete*. Human Kinetics Pub. Inc., 1984.

SHELLOCH, F.G. 'Physiological benefits of warm-up'. *The Physician and Sportsmedicine*, 1983.11(10).pp.134-139.

SPENCE, ALEXANDER P. *Basic Human Anatomy.* The Benjamin/Cummings Pub. Co.Inc., 1986.

Sports Injury Prevention Program. Cumberland College of Health Sciences and Footscray Institute of Technology, 1987.

The Arts: Some Australian Data. Australia Council, 1989.

VINCENT, L.M., M.D. *The Dancer's Book of Health.* Dance Books Ltd., London WC2, 1980.

Suggested reading

ATLER, MICHAEL J. *Science of Stretching.* Human Kinetic Books(Aust), 1986.

ARNHEIM, DANIEL D. *Dance Injuries. Their Prevention and Care.* Dance Books, Cecil Court, London,1986.

CLARKSON, P. M. & SKRINNAR, M. *Science of Dance Training.* Human Kinetics Books, 1988.

Exercise Danger. Wellness Australia Pty. Ltd., 1988.

Fitness Testing - a Guide. Fitness and Safety Section, Commonwealth Department of the Arts, Sport, the Environment, Tourism and Territories. Australian Government Publishing Service, 1988.

FITT, SALLY SEVEY. *Dance Kinesiology.* Schirmer Books, New York, 1988.

GRAY, JUDITH A. *Dance Instruction.* Human Kinetic Pub. (Aust), 1989.

RYAN, ALAN J., M.D. & STEPHENS, ROBERT E., Ph.D. *The Dancer's Complete Guide to Healthcare and a Long Career.* Bonus Books, Chicago, 1988.

Sports Injury Prevention Program. Cumberland College of Health Sciences and Footscray Institute of Technology, 1987.

Towards Better Coaching. Frank F. Pyke, ed. National Coaching Accreditation Scheme, Australian Sports Commission, 1986.

Suggested viewing

Fitness Testing - a Guide. Videotape produced by Film Australia for the Commonwealth Department of the Arts, Sport, the Environment, Tourism and Territories.

VASS, NICOLE. *The Ballet Floor Barre.* Videotape produced in South Australia.

APPENDICES

Note: Ann Clarke's description of the Injury Survey statistics is a lengthy technical document, of most value to serious researchers, who may obtain copies from A.A.D.E. (National) on payment of a fee to cover costs. Write to the A.A.D.E. at the address at the front of this report.

APPENDIX 1(a)

THE DIFFERENCE BETWEEN BEING WARM AND WARMING UP

by Tony Geeves *(D.A.N. Nov ember 1989)*

As this is my first article after introducing myself last month, I feel that it is appropriate that I take up and expand on the subject of warm-up and some of the implications and misunderstandings.

In a sense this can be a psychological warm-up to the idea of safe dance practices but for the moment I shall confine myself to physiology.

What is a warm-up?

A lay definition of this concept could be:

- anything and everything that is done to prepare the body before physical exertion.

Another way to explain the process of warm-up would be:

- something that prepares the body for increased exertion.

Without it, you run the risk of injury.

As the muscles become warmer, they also become more pliable. The best muscle warmer is your own circulation, so the trick is to increase your blood flow by slowly exercising. In addition to tuning your body this also cuts down on muscle soreness when the session is completed.

A more precise definition of the term 'warm-up' in relationship to dance training is offered by Shelloch (1983):

"Each class should include a section of continuous movement of 15 minutes or longer which

uses large muscle groups and is of sufficient intensity to increase the internal body temperature by one or two degrees so that the dancer begins to perspire.

This temperature elevation allows more efficient energy production to fuel muscle contraction, increases the flexibility of the tissue, allows for faster relaxation and contraction of muscle, and increases the rate of transmission of messages along the nerves" .

The significant words here are "*internal body temperature*".

With the approaching Australian summer, the differences between being warm and warming-up are not always so apparent to the uninitiated.

The sweat pouring down your face at the beginning of class may be induced by stress related to a new enviroment, a different teacher or the combination of a number of other seemingly unrelated factors.

I have known dancers who took a hot shower, applied liniment, put on woollen body tights, sat on the heater and were convinced that they had warmed-up! This was a sure sign of a short career.

A thorough warm-up includes general preliminary exercises and stretches followed by more specific steps, movements and combinations, initiated gradually and vigorous enough to cause perspiration.

Why you have to warm-up

Elements of the concept 'warm-up' are:

Circulation

An increase of heart activity and blood circulation with a simultanous redistribution of the blood. The blood flow increases to the muscles and decreases to the digestive organs. With hard or constant work

the body's warmth is transported to the skin by an increased flow of blood.

This transition occurs with muscle activity and is necessary so that the work can continue for an extended period. Different psychological factors can also influence circulation, and this transition can begin before muscle activity takes place.

Fear and the adrenalin shock that follows or mental exercises such as biofeedback, yoga, meditation and autogenic training can also have this influence on circulation.

With muscle activity the circulation and breathing stabilises after approximately 3-6 minutes (second breath).

Joints

Movement in the body's joints increases the volume of fluid and the thickness of the cartilage. This improves the joint's shock absorbing ability and prevents direct wear on the bones.

Movement in the joint increases the flow of blood and raises the temperature, which in turn increases the elasticity and movement in the joint's supporting tissue. This transition happens within 10 minutes of the movement's beginning and is almost completely gone 30 minutes after the movement is completed.

This makes it clear that if you have a 30 minute break you must warm up again.

Muscles

In order to execute hard work the muscle's metabolism must begin, and this demands an increased flow of oxygen through the blood. An increase in the muscle's temperature, which can be as low as 30°C when resting, improves the muscle's performance ability.

Nerves

Nerve impulses travel faster in warm muscle and muscle viscosity is less, making contraction easier and more efficient. The optimum temperature for the speed of chemical reactions and metabolism involved in muscle functioning is in the neighbourhood of 102° to 103° Fahrenheit, and the only efficient way to reach this temperature in the muscle is by working it.

Relaxation/concentration

Relaxation can enhance the interplay between the synergistics (the contracting or working muscles)and antagonistics (the muscles being released to allow the movement to take place) and in this way increase the effectiveness of the work.

Concentration is neccessary for all types of demanding work.

- Lack of concentration because of tiredness or stress increases the risk of injuries.

Both concentration and relaxation are techniques that can be learnt. These areas of sports psychology are easily adapted to dance and may hold one of the keys to a safer future.

Stretching

Ballistic (e.g. bobbing, lunging and bouncing) forms of stretching can result in muscle or tendon injuries and should be avoided.

Static stretching exercises are recommended over the ballistic because they do not invoke a strong stretch reflex. In this type of stretching the muscles are slowly placed in a stretch and then held in that position.

- **Take care of yourself all the time and remember that pain is not progress but a signal that you have gone too far.**

There are other forms of stretching (see Michael J. Alter's *Science of Stretching*, published by Human Kinetics Aust) to increase your range of movement but remember this is about warm-up, so easy does it.

References

- ASTRAND, P. O., RODAHL, K. (1977). *Textbook of Work Psychology.* (McGraw-Hill). 175, 278, 279.
- BENNET, A.F. (1984). Thermal Dependence of Muscle Function. *Am. J. Physiol.* 217-229, 247.
- LUNDIN, M.(1985). Unpublished paper in Swedish. On warm-up. (Stockholm).
- SHELLOCH, F.G. (1983). Physiological benefits of warm-up. *The Physician and Sportsmedicine.* 10, 11, 134-139.
- VINCENT L.M., M.D. (1980). *The Dancer's Book of Health.* (Dance Books Ltd.: London W.C.2). 30, 31.

APPENDIX 1(b)

ANOREXIA NERVOSA

by Tony Geeves *(D.A.N. December 1989)*

For this month's **SAFE DANCE** article I have chosen to concentrate on how to recognise and tackle *Anorexia Nervosa* (nervous loss of appetite; self starvation), because of the anxiety this can create in all of us who are responsible for the care and guidance of young people's lives.

This collection of symptoms is largely confined to white teenage girls in western cultures, at all socio-economic levels. The beginning is often simultaneous with the onset of puberty and the rate of mortality can be as high as 10% if no treatment is initiated.

There is reason to suspect that A.N. is on the increase, not only in the above mentioned group but also amongst women from 11 years to 60 years and even males.

- **This is a sickness of our times, with deep underlying pathology that can be precipitated by cultural pressures.**

Cultural pressures

These are very specific if one looks at fashion, advertising and the accepted female "stars" of film and television.

The personality type that is unable to withstand this kind of pressure, replaces a delicate defence structure with a protective armour of rituals and compulsions, hoping to create a secure inner world. Instead, a personality disorder develops that can be long lasting, difficult to cure and in some cases deadly.

This is a sickness whereby psychopathology becomes physiopathology, which is of particular significance to those of us involved with psycho somatic therapy.

The psychopathology dynamic differs, depending on the type of personality structure or organisation with which we are dealing. Culberg divides anorectics into two categories.

1. The hysterical personality whose extroverted behaviour (the best little girl in the world) and seeming indifference to her symptoms are in strong contrast to her inner reality, which is dominated by the fear of abandonment.

This personality type has reached object constancy and has a strong ego but the inability to accept responsibility for emotions communicated helps create an unstable character who uses hysterics to manipulate her environment when exhibitionism or dependency fails to produce the required results.

2. The compulsive/neurotic type who often possesses borderline traits (the "as if" personality according to Deutsch, H.), or is extroverted and depressive.

These types of personality disorders occur much earlier and are therefore more difficult to treat. The fact that object relations comes and goes, at times only existing with the object makes it particularly hazardous for the less experienced therapist to treat this type of personality.

The primitive defence of splitting is often reinforced by a bad memory and defended by projective identification, compulsive/ritualistic behaviour and the two-edged sword of aggression/dependency.

The fear that their love is destructive to the recipient and a drain on their own emotional reserves is difficult to handle, as this is a sense of reality disorder which adds confusion to the real issue, which is the

absence of a "holding" structure (in the Winnicott sense) in their early lives.

Recognising danger

My intention in choosing this particular subject is to create a general picture of the characteristics of the potential anorectic, thus enabling dance teachers and responsible adults to recognize adolescents in the danger zone.

In the field of dance, which is our special interest, the concept of "thin" is relative to the demands of the profession. Therefore the ability to distinguish attitudes and family constellations is of the utmost importance.

The adolescent in the danger zone can be in an unhealthy symbiotic relationship to the parent and may appear extroverted, good humoured and capable. However, this is not a reflection of her inner reality; it is in order to comfort the parent, who is forever tired, listless and by inference or attitudes, allows and even encourages the child to shoulder the responsibility of parenting itself and sometimes also the parent/s. This situation is compounded by the onset of puberty with all its implications of sexual maturity, adulthood, future parenthood and independence.

Even for the normal healthy adolescent this is a period of crisis. For the adolescent whose defence systems are structured around hysteric or compulsive traits, this crisis is resolved by "conversion reactions", which Cameron (1963) defines as:

". . . a process whereby an unconscious conflict is transformed (converted) into a body symptom which reduces tension and anxiety by expressing the conflict symbolically".

Conversion reactions persist because they achieve something (they fill an adaptive function). In the case of anorectics, the primary and secondary gains are evident:

1. non-acceptance of parental domination, i.e. refusal of the ideas being forced down their throats, represented by food;

2. the attempt to control their own environment, i.e. refusal to eat and thereby grow up to become sexually mature, independent adults.

The anorectic uses magic thinking to compensate for the lack of care or lack of personal power. Whilst this is natural in the small child's development (as a way of reducing anxiety and creating a sense of security) in the anorectic it leads to enslavement in the form of ever more rigid and compulsively more complicated rituals.

The anorectic sees herself as **either/or** which is simplified to :

- food/weight (control)
- fat (lack of control)

This indicates a non-integrated personality (in terms of Mahler's (1984) good/bad object) arrested at the stage of oral development (in terms of Freud's theoretical structure).

As this sickness develops, the line between psychic and somatic symptoms becomes blurred. It is difficult to evaluate how much physical damage anorectics have inflicted on themselves because of their emotional imbalance, or how seriously their metabolic disturbances are affecting the *psyche*.

Stages of the process

The psychopathological process develops in stages, as presented by Culberg (1984) and corroborated by Levenkron (1986), although their division of symptoms differs.

The process begins with normal dieting that gradually becomes more compulsive, slowly involving everyone in the surroundings. The weight loss is

drastic and visible, which provokes the people who are responsible for the person's welfare.

This has been described as the perfect choice of illness, as it includes undeniable demands for care, coupled with equally strong rejection of the caregiver!

It is during this stage that the teacher or interested persons would be most advised to begin some responsible form of investigation, such as inviting the person to an informal lunch to learn something of their eating habits, followed by informal discussions of the family situation, to ascertain who buys the food and who does most of the cooking.

The teacher can try to discover if meal times appear to be compulsively regular and what interests the family have in common, aside from the person's appearance, weight and training habits.

If the pattern reveals itself to be one of compulsive behaviour and rituals structured around food and exercise, it is time to discuss therapeutic intervention.

- **It must be borne in mind that food is not the problem for the anorectic, it is the answer**

The first step is to obtain a clinical diagnosis. If some form of treatment is not initiated the process continues.

At a certain point of starvation the body begins to compensate for the lack of nutrition by cutting down some of its energy demands, i.e. menstruation ceases, blood circulation to the extremities is reduced and the ability to concentrate decreases.

In the final stage, therapy is still a viable tool but it must be complemented by hospitalisation and monitoring of a number of somatic functions. The problem has become one of somatic pathology. The individual can weigh as little as 30kg., and the body utilises its last energy resources for its metabolism. This is a self destructive process and a threat to the individual's very existence.

A feeling of confusion is usual at this stage and the risk of infection is extremely high. The individual's attitude is apathetic. The only solution now is active intervention in the form of compulsory admittance to a well equipped hospital.

I hope that this article will act as some form of catalyst for more open discussion of this enigma and thereby reduce the anxiety in this milieu with regard to our responsibility in precipitating the collection of symptoms known as *Anorexia Nervosa*.

It is important to keep in mind that this collection of symptoms, or personality defence structure, is the expression of a deep seated psychopathology developed in an individual's early life and that a reasonably healthy adolescent in a reasonably healthy environment will not react in this way.

References

- CAMERON, N. (1963). *Personality Development and Psychopathology*. (Houghton Miffin Company: Boston). 302.
- CULBERG, J. (1984). Dynamisk Psykiatri. (Natur och Kultur: Sweden).
- MAHLER, M. BARNETS. (1984). Psykista Fodelse. (Natur och Kultur: Sweden).
- LEVENKRON, S. (1986). Anorexia Nervosa. (Natur och Kultur: Sweden).

APPENDIX 1(c)

CARE OF THE INSTRUMENT

by Tony Geeves *(D.A.N. February 1990)*

"The best exercises are those that train the body and delight the mind". (Galen 130-200 A.D - 'The Father of Anatomy')

Metaphors have been used in the teaching of dance throughout the ages. It is acceptable in some areas of the dance profession to refer to the body as the instrument of the dancer. However it is important to keep in mind that all systems of the body are inter-related, and each is affected by physical or mechanical stresses, chemical or biological reactions, social or psychological pressures.

The great teachers insisted that dance training should develop continuously, following and reflecting the needs of the choreographers. Although they could not foresee the tremendous advances in technique and the physical range of movement now required, nor the cultural pressures that would change the type of bodies expected to command this technique, they built in this elementary safety requirement so that performers would be adequately prepared.

To protect the individual's self-esteem, the process of teaching or facilitation of learning must be caring, considerate and empathetic. It must be clearly understood that the reason for appraisal of students'/dancers' physiognomy and physiology is (a) to provide them with a realistic body image (in relation to the profession of dance) and (b) to evaluate the individual structure's ability to tolerate the training load to which it will be subjected during education/training or professional career.

If dancers are feeling put down by a teacher or their current dance milieu, it may well be time to consider other venues or options. **Positive self-esteem is a**

prerequisite for the fully functioning person and a real factor in injury prevention.

Traditionally, technique, alignment, flexibility and aesthetics are the areas in which teaching and training are concentrated. With the advances in dance/sports medicine and the research being done in the dance sciences, we now have available relatively easy-to-apply techniques to evaluate the individual body's strengths and weaknesses and can avoid some of the pitfalls of the past - always aware that we are not dealing with an object but a whole individual.

Prevention and care

1. Medical check. 2. Physical conditioning 3. Graduated training load 4. Avoidance of 'too much too soon' 5. Warm up/Cool down 6. Fluid replacement 7. Consumption of a low fat, high complex carbohydrate diet. 8. Environment

1. Medical check

At least once a year or before increasing the work load, i.e. intensive courses, full time dancing or dance education programs, pre-season, performances or tours.

2. Physical conditioning

Some of the components of conditioning i.e. cardiovascular endurance, strength, anthropometry (body measurements) and alignment could be tested before taking on an increased work load in an endeavour (i) to reduce the possibility of injuries and (ii) to set guidelines for the amount and type of training program most advantageous for attaining the required strength, power, endurance, enhancing body composition and correcting muscle imbalances where necessary.

(a) Cardiovascular endurance

It is recognized from research that a high Maximum Aerobic Capacity (VO2max: the maximum amount of oxygen that an individual can utilise to produce the energy required for work) is a positive factor in injury prevention. One of the possibilities in dance would be to structure time management of the training class in an endeavour to increase VO2 max.

Barre/Floor work: - 30mins.
(sub maximum work load).
Centre work: - 20mins.
Jumping/running
combinations - 30mins.
(maximum work load - a physical work intensity taxing between 80% and 100% of VO2 max.

The pulse rate (heart beat per minute) rarely exceeds 120 during the first 50 minutes of a dance training class. It is therefore necessary to make certain that during the last 30 minutes the pulse rate (equivalent to the work load) is sufficient to increase the VO2 max. (rest pulse plus 75% of the difference between rest pulse and maximum pulse). This will enhance cardiovascular workload.

All jumping /running combinations could be 32 or 48 bars long. The groups could be divided equally so that everyone would work and rest at planned intervals, turning that section of the class into interval training as used in physical training programs. This length of combination was already common in dance training as early as the 19th century, as is evident in the Bournonville and Cecchetti classes from that period. In this case traditional classical training is validated by modern sports medicine. The length of combination in some jazz classes is already a step in the right direction.

(b) Strength

It is important to strive for a balance between flexibility and strength in order to avoid injury. It is not the number of repetitions that increase the strength but the high loads, such as holding the leg

in extension. In the dance world, endurance is often confused with strength (how many, instead of how much). A balance between muscle groups must also be achieved when strengthening. Cybex and other apparatus used to measure and strengthen are available in sports medicine clinics and some dance medicine clinics and can be used as an adjunct to dance training.

(c) anthropometry (body measurements)

We are all aware that too much weight is damaging to the hips and knees in some techniques. The questions are, how much and what type of weight is too much and who decides? These questions may be put into a useful perspective by the "O" scale system that is now in use at the Australian Institute of Sport and available through a nutritionist/physiologist in most large cities. The system was designed expressly to assist health professionals in their efforts to provide clients and patients with the very best assessment presently available. It can give the dancer an indication as to the ratio of lean muscle to adipose (fat) tissue which responsible dancers can then utilise on a continuing basis to assess the effects of training and diet on their physiology.

(e) alignment

Impaired postural balance affects the kinaesthetic sense, the ability to perceive what is happening. There is a subsequent reduction in the skilful performance of certain movements. Although many experienced teachers have an eye for alignment it may be reassuring to know that there are a number of techniques used to screen posture alignment such as the grid, the plumb line, the pedograph and the podioscope. For those dancers interested in assuming the responsibility for their own balanced well-being, a description of these techniques can be found in Arnheim's book (1986).

3. Graduated training load

The tenet of "start slowly and progress gradually" with each new dance class is the responsibility of both the teacher and the dance student. No matter how empathetic or talented, the teacher is unable to experience pain or emotion for a student. The individual student should be aware of his/her level of tolerance and never work through pain, fatigue, illness or injury.

4. Avoidance of "too much too soon"

Particularly after an injury, be aware of your internal messages. Take the advice of a dance medicine specialist before you return to class and again when you intend to increase your work load.

5. Warm up/cool down

This point cannot be reiterated to often. The dancer must warm up properly before each class and stretch all major muscle groups (not beyond the pleasure/pain barrier) before executing any fast, full range of movement techniques. Do not stand still immediately after dynamic physical steps, cool down gradually and stretch (not beyond the pleasure/pain barrier).

6. Fluid replacement

Particularly in Australian climatic conditions fluid replacement is of paramount importance. Dehydration can lead to muscle cramping, exhaustion, nausea and injury due to fatigue. A good general rule is to drink a glass of water or juice for every 20 minutes of vigorous dancing.

7. Consumption of a low fat, high complex carbohydrate diet

The complex carbohydrates found in breads, grains, fruit, and vegetables should constitute 60% of the daily calorie intake. Remember, "food is a friend" (this does not include junk foods), fat should

be less than 25% (so count the chocolate bars) and protein 12-15% of the daily calorie intake.

8. Environment

Floor structure, texture of floor surface, height of ceiling and ventilation are some of the aspects to be considered. Concrete surfaces and crowded or poorly ventilated studios should be avoided.

With regard to health, safety and self-esteem a question all dancers must ask themselves should be "Do I have history of, or a problem with, substance abuse?" A drug is any substance that, when taken into the system of a living organism, can modify one or more of its functions. That includes nicotine, alcohol, stimulants, appetite suppressants, sedatives, tranquillisers and anti-inflammatory drugs.

I have attempted in this article to adapt and cross-fertilise the terminology from sports medicine, physiology and psychology. **The aim is to use sports science in an endeavour to enrich our art form.**

References

- ARNHEIM, Daniel D. (1986). *Dance Injuries. Their Prevention and Care.* (Dance Books: London).
- ASTRAND, P. & RODAHL, K. (1986). *Textbook of Work Physiology.* (McGraw-Hill).
- BUSWELL, J. (1985). The A.B.C. of body care. *Dance: The New Zealand Experience. Papers and proceedings, Auckland.*
- CLARKSON, P. M.& SKRINNAR, M. (1987*a*, 1988*b*). *Science of Dance Training.* (Human Kinetics Books). 233*b*, 234*b*.
- EKSTRAND, J. & GILLQUIST, J. (1982). The frequency of muscle tightness and injuries in soccer players. *Am. J. Sports Med.*

- FIXX , J. (1977). *The Complete Runner.* (Random House Inc.: New York).
- GEEVES, A. (1985). Classical Dance Training for Men. Unpublished paper. (Stockholm).
- MOREHOUSE, L.B. & RASCH, P.J. (1963). *Sports Medicine for Trainers.* (W.B.Saunders).
- RYAN, Alan J., M.D. & STEPHENS, Robert E., Ph.D. (1988). *The Dancer's Complete Guide to Healthcare and a Long Career.* (Bonus Books: Chicago).

APPENDIX 1(d)

THE METAMORPHOSIS OF A DANCER

by Tony Geeves *(D.A.N. March 1990)*

Some reflections and guidelines on the painful transition that comes to all of us whose working role in society has become our identity.

Is there a life after dance? Is it worth searching for and if so how does one begin? Who am I when I am no longer a dancer? What is my new role in society when I am no longer an active artist and how do I relate to other people in this new role? How will it change the way in which other people relate to me? Am I able to continue support of my present lifestyle? What other skills, if any, do I have and how can they be adapted to my new role?

There is a need in the dance community for an empathetic approach by qualified professionals to offer some type of re-entry program in the form of a transitional space in which to mourn the loss of professional identity, become aware of what existing life skills can be adapted to the new situation, and come to terms with the loss of the ecstasy of dance.

I suggest a theoretical framework identifying six stages in an ongoing process of adaptation or readjustment.

The time taken depends on the individual. Some may look for the support of a therapist during the process, others will prefer to tackle it alone or to work it through with their families. It is only fair to add that it can involve an enormous emotional strain on friends and family. Professional support can be a blessing to the individual's entire contact network.

Awareness of some of the pitfalls or having the advantage of some guidelines may make the journey less anxiety-provoking and even something of an adventure.

Some of the signposts to guide the process will probably be:

Denial, Euphoric recall, Reality testing, Grief and mourning, Reframing, Adaptation. They will not necessarily appear in that order or emerge so clearly labeled, however merely focusing awareness on them will assist to establish the individual's current position in the process. In the meantime of course ordinary life continues!

Denial

The power of this defence mechanism is often underestimated. It takes as many forms as there are individuals, however there are at least three broad general categories that are easily recognised in the dance milieu.

1. The aging artist who is unable to accept the passage and ravages of time:

- we can seldom identify this syndrome in ourselves and denial protects us from "looking through the glass darkly". While day-to-day physical health is good (no injuries, stable weight), and roles to dance and good reviews are forthcoming, it is difficult to realize that the end of an active career is fast approaching. Some are more aware than others and reluctantly relinquish the more demanding roles before the deterioration of previous skills draws unwanted attention. Even the constant presence of younger, competent, ambitious dancers is not always enough to jolt the illusion of immortality. Contemporaries may support the illusion, perhaps partly to avoid their own anxiety and partly in an effort to be supportive.

2. The dancer who intuitively comes to understand that his/her career is at a standstill and has begun to stagnate:

- rather than face the painful facts, it may be less emotionally traumatic to use denial, which may result in a "reaction formation" whereby a

psychosomatic injury appears. This in turn forces the dancer into early retirement with all the underlying anxiety and unresolved conflicts still to be dealt with.

3. The dancer who is hanging on until pensionable age:

- this can be long after they have lost the desire to dance, and is a form of denial particular to dancers ending their career after many years in institutionalised theatres. (This particular issue may be one of the future in the Australian community where superannuation is just becoming a reality) It can be the cause of guilt and aggression which is internalised and hinders the development of the individual's interpersonal relationships. This needs to be dealt with so that the individual's process can continue.

Euphoric recall

The pleasure of this device is extremely seductive, has all of the charms of Medusa and is equally as dangerous and disappointing.

What a temptation it is to surround oneself with pictures, awards and mementoes from a time gone by, to remember only the glorious, moments when one felt attunement with an audience, the worthwhile roles, the ecstasy of physical accomplishment, the extraordinary classes, exceptional teachers, creative rehearsals, exciting travels, exotic receptions and supportive *cameraderie* of the other dancers.

The Great Wall of China was never as effective as this strategy in avoiding the reality of another dimension. A hostage of this device can never compare the future favourably with the past because the past has become perfect. Change or development remain unthinkable alternatives to this rosy glow, but the disappointment that can follow such stagnation often leads to depression. The antidote is reality testing.

Reality testing

It can be both painful and suprising to actually make the effort to recall a more homogeneous experience, this time including the painful moments of misunderstanding and deception, the inadeqate sleep, the physical demands,the often poor working conditions and salary, the vicious tongues of ambitious, frustrated or untalented people and worst of all the incompetent, thoughtless, unfeeling and often arrogant attitude of some people in positions of authority, insecure about their identity now that they are no longer dancers and uncertain of their talents and how to wield their much sought-after power.

Grief and mourning

In a world where "the show must go on" and emotions are professional commodities, there is a high threshold and a low tolerance of personal grief and little time for the traditions of mourning. The end of a long career may be an appropriate opportunity to combine years of holding back with the sadness of losing an important part of one's identity and allowing oneself to relearn the art of expressing personal grief spontaneously.

This can be a traumatic experience for those who have kept emotional reality - and often friends - at bay by the use of repartee and black humor. This is when the support of others, professional or otherwise, will make life worthwhile and bridge the abyss of loneliness.

Reframing

There are many techniques to choose from, both verbal and non-verbal. Dancers have always used their bodies as the primary means of expression and therefore may have some sense of control of this medium, having many of their defences locked in their muscles. Consequently, I feel that an eclectic approach is most suitable, including body therapies with verbal support.

Adaptation

The first step is to learn to recognise, appreciate and identify the value of the skills that are stored in the body/mind from years of experience in the work force. The list of skills that the dancer has already acquired in dance training could include:

time management, discipline, focus, personal presentation, loyalty, group dynamics, space management, team work, patience, knowledge of theatre, knowledge of other art forms.

The next step is to FOCUS on the area where the dancer would enjoy making use of current skills and to research the new skills needed. The dancer is already in possession of the necessary Discipline and TIME MANAGEMENT skills. personal presentation is also likely to be immaculate (which will be critical at job interviews) and the dancer's ability to work as a TEAM member will assist survival on the job.

One of the major "problems" may well be that a dance background encourages over-achievement. This manifests itself when the ex-dancer realises that few others read all the material suggested for courses or are always on time with work prepared. It may also be apparent that others spend fewer hours on the job in an effort to get everything up to date.

It is unthinkable for ex-dancers to approach a performance without knowing what will be done on stage, so their preparation will always be adequate. However it may be try their patience to work with people who approach examinations without having read the required material, or who come to meetings unprepared.

Having successfully survived this journey, the individual emerges ready to face the excitement and terror of a different lifestyle, firmly grounded on integrated past experiences with a new-found healthy self-image, and a readiness to weather the knocks of new experience.

APPENDIX 1(e)

THE ROLE OF THE DANCE TEACHER

by Tony Geeves *(D.A.N. April 1990)*

"All the world's a stage" - especially in the arts professions.

It is common in Australia , and particularly in Canberra, to talk about "hats". Which one are you putting on for this discussion, (who am I representing)? Will one get in the way of the other and produce a conflict of interest?

In the past, the role of the dance teacher was defined by tradition, and assimilated by mirroring and role modeling. The question of styles (hats) has seldom been considered, as the vast majority of teachers wear the "hat" of their guru or organisation, and endeavour to accommodate their own personalities to the needs of this "hat". This applied to many forms of teaching until the advent of the teaching sciences.

The dance being taught in this country is still largely regulated by foreign associations, organisations, academies or gurus/schools. The last-named were often renowned dancers/choreographers who usually developed and codified their own method or technique on their own bodies, and then had no way of knowing how their system would affect other body types or age groups. That is the subject of another discussion.

This article is about how dance is being taught, or teaching method. It is terminology which has created some confusion in parts of the the dance community, where "method" has come to mean the actual teaching of dance technique and how it is assembled and passed on to the student (content).

The role and behaviour of the educator and sports coach has become the subject of a wide range of contemporary literature.

By 1980, in an Australian book entitled *Towards Better Coaching* Daly (1980) expressed the notion that *"Many coaches, and the club committees who hire them, still consider that the only qualification needed to be able to coach is success in a sport and concomitantly a 'knowledge of the game'"*.

This attitude continues to manifest itself in our field. Evidence of the teacher's personality, ability (as a dancer) and traits is required in job applications. Evidence of such elements as teaching style, characteristics and behaviour is rarely submitted or considered.

In consideration of the dance students and dancers who endure a distorted body image, low self esteem and sustain a high rate of injury, it is time to examine the situation.

- Do we teach the acquisition of skills in the most beneficial way?
- Can we learn to vary the ways in which we teach?
- Do we use different teaching methods to facilitate the learning of such diverse components as classical technique and creative dance?
- Are we conscious of the differences?
- *"Are we training our students to understand and develop their own technique or are we taming them, so that they are conditioned to respond to a recognized stimulus? (No matter how empathetic or talented, the teacher is unable to experience pain or emotion for a student. The individual student should be aware of his/her level of tolerance and never work through pain, fatigue, illness or injury)"*. Geeves (1989)

In line with Gray's (1989) suggestion for the American dance community, we also need to *"develop a descriptive list of dance teacher actions that in turn would provide a basis for detailed dance teacher behaviour analysis"* of Australian teachers.

There are now a number of studies available, many of which are listed in the bibliography of Gray's noteworthy book *Dance Instruction.*

Dance teaching can be approached analytically, intuitively or with a combination of the two. If one is gifted with one of these approaches, some insight into the other would create a more balanced perspective.

The following are some indicators that we could use for self appraisal to analyse our teaching and stimulate discussion.

Role of the dance teacher

1. Style

The following are three broad categories of teaching style and their boundaries can overlap. They are offered here as guidelines to aid recognition.

(a) authoritarian

This stereotype is fanatic, operates with a high level of energy and is always right (no discussion); plans well, expects complete attention, does not make "mistakes" and is unforgiving of others' "mistakes"; experiences difficulty when confronted with the unexpected.

- **Plus:** establishes an atmosphere of discipline, dedication and purpose.
- **Minus:** creates a pecking order which can be destructive, especially when all is not going according to plan. Sensitive, thoughtful and introspective personalities have problems with this type of hypercritical teacher. Injuries are considered to be "mistakes".

(b) personable

This balanced, concerned approach can be both flexible and creative, the teacher is appreciative of hard work and supportive when needed

- **Plus:** establishes an atmosphere of goodwill and mutual respect that encourages the enjoyment and sharing of each other's progress and creates a strong group bond

- **Minus:** can be considered to be indecisive or weak, especially by those who have little or no personal discipline (lack personal boundaries)

(c) casual

Totally uninvolved, relaxed and passive. Never prepares and often just gives the same class.

- **Plus:** imposes no pressures to perform; Independence develops in those predisposed to it.

- **Minus:** does not satisfy the serious dance student, because of the overall lack of planning and development

Each style has plus and minus points, but when consciously combined and applied by the creative teacher are a valuable extension to personal style and enable the teacher to reach a broader range of student personalities.

2. Characteristics

The pre-requisites of the teacher:

(a) knowledge

- Dance teaching is becoming a science as well as an art where a knowledge of dance technique and performance, coupled with the principles of exercise physiology and kinesiology, form a framework, supported on a firm information base of injury prevention and management.

(b) organisation

- The question of organisation is probably the single most important aspect of the teacher's skills. Although the success of the teacher may be seen in the final outcome, the way in which the skills are built (i.e.no major injuries), is important to the confidence of the artist. This aspect is largely covered by a multitude of syllabi, which should be used as a framework for the creative teacher and not as dogma.

(c) honesty

- Method and style may vary, but communication is always a two-way process based on mutual trust. *"Approve in public, criticise in private"* works well.

3. Function

Dance teaching usually involves a group, and these guidelines to a teacher's function assume that that is the case.

(a) teaching - group

- Guidance is given to the class as whole, facilitating the learning of technique, with the teacher organising and instructing

(b) teaching - personal

- Guidance is given on a one-to-one basis to the exclusion of the group

(c) non-teaching

- Punishes, presents personal point of view, remains silent, tells jokes, etc.

(d) counter teaching

- Uses sarcasm and/or criticism of a personal nature, expresses disappointment or frustration (e.g. frowns, shakes head)

4. Behaviour

Because dance teaching is characterised by a range of non-verbal behaviour, very little research has been done on the verbal component of dance teaching, and this is an area that requires attention.

(a) verbal

- Instructs, corrects, affirms, questions, evaluates, uses imagery, directs, invites, reviews, commands etc.

(b) non-verbal

- Leads, demonstrates, manually assists, observes, listens.

A chapter could be written on each of these subheadings. The starting point is, how much of the class time is utilized by the teacher verbalising or demonstrating and how much actual practice time is left for the students?

5. Proximity

Does the distance at which you teach depend upon the age of the students?

- **Close range**: works closely to form a bond of intimacy?
- **Medium range:** works within range of sociocultural contacts.
- **Long range:** feels the need to keep a "safe" distance

Proximity has a close relationship to "hands-on" (tactile) teaching, which is a two-edged sword. Students can become dependent on physical contact to feel that the teacher cares for them, while others can feel harassed, but if students are "tamed" they will be unable to express their discomfort in a healthy way. What is mothering to one student may be

smothering to another. A fatherly pat to one may be a blow or an invasion of privacy to another.

It is imperative that teachers differentiate their own needs from the needs of the student and are aware of the tactile elements in their own teaching.

6. "Hands on"

(a) tactile

- Correction by manual assistance is one of the norms in dance teaching, but there is no training for dance teachers in this practical area. How one touches to facilitate learning and avoid misunderstanding can also be an aquired skill and is taught on a practical level to such people as physiotherapists.

(b) non-tactile

- For some individuals, touching is not a part of their teaching, and they convey the message through other media.

(c) uses baton, ruler, book, etc.

- Others choose to use a physical object as a way to maintain boundaries between themselves and the student.

According to E.T. Hall, how close one comes to others is a question of socio-cultural conditioning. He has explored man's perception of personal space and created the theory of *Proxemics*.

7. Mobility

(a) Moves about the entire studio

(b) Moves about in the front of studio

(c) Sits/stands in one place (moves out to demonstrate)

(d) Sits/stands in one place (moves out to correct)

Are there blind spots in your teaching? Do you move about the studio? Do your students have favourite places in order to be seen or not to be seen?

8. Dynamics

Having a personal movement profile made (e.g. Labanalysis - Effort/Shape; Kinetic Sensory Studies) would give teachers guidelines as to the dynamics already available to them.

This process would also elicit missing elements in their own movement vocabularies, providing information which would enable teachers to facilitate the acquisition of technique for students with differing movement dynamics, and thus broadening the total effectiveness of their teaching.

Conclusion

"Having identified your teaching approaches, you may find elements that you will adapt or change. You may wish to introduce new elements into your teaching, or you may find that your present approach is professionally appropriate and personally satisfying". Gray (1989).

Either way, this process of reflection will contribute to an increase in your awareness and enhance your teaching.

As Stinson (1985) wrote so poignantly in her paper for the Dance and the Child International Conference in New Zealand:

"We must also study ourselves, reflect upon who we are as a person, define and redefine our values in dialogue with other voices. We must look especially at the parts of ourselves that are fearful, uncomfortable, worried, and ambivalent, and at the parts that feel right to us even in ways we do not understand".

Only when we are fully aware of how we ourselves are teaching dance will we be able to know the most

beneficial way to guide each student in our care - and the most effective way to communicate both technique and the skills required for development of the fully functioning artist.

References

- GEEVES, T. (1989). Care of the Instrument. Paper published in *Report Of The Meeting Of The National Council of Tertiary Dance Directors and the Artistic Directors of Australian Dance Companies.* (Adapted version which does not contain the paragraph quoted on p. 25 appears in Appendix 1f).

- GRAY, JUDITH A. (1989). *Dance Instruction. Science applied to the art of movement.* (Human Kinetics Pub.: Australia). 26, 41,153.

- PYKE, FRANK S. ed. (1980). *Towards Better Coaching. The art and science of sports coaching.* (Australian Government Publishing Service). 6-8.

- STINSON, SUSAN W. (1985). Children's dance: a larger context. *Dance - The New Zealand Experience. Papers and Proceedings daCi. Conference.* (Auckland).126

APPENDIX 1(f)

Selection of the dancer

by Tony Geeves *(D.A.N. May 1990)*

(Adapted from a paper presented to the AADE conference between the National Council of Tertiary Directors and the Artistic Directors of Australian dance companies, Sydney, December1989)

All systems of the body are interrelated. One affects the other, just as each system is affected by physical or mechanical stresses, chemical or biological reactions, social or psychological pressures.

All tertiary dance institutions and dance companies hold auditions, where traditionally the students/dancers are evaluated (technique, power, strength, alignment, flexibility musicality and aesthetics are traditionally considered) by a multi-disciplined panel.

It is important for these panelists to highlight their own awareness (muscle memories) of the experience of auditioning which involves an emotional risk on the part of the individual, an offering of one's self.

In order to protect the individual's self esteem this process must be considerate, friendly and cooperative on an adult level of interaction.

Historically the great teachers insisted that dance training should develop continuously, following and reflecting the needs of the choreographers.

Although they could not foresee the tremendous advances in technique, the physical range of movement that is now required or the cultural pressures that would change the type of bodies which would be expected to command this technique, they built in this elementary safety requirement so that performers would be adequately prepared.(This is now referred to as specifity in physiology).

Some Institutions already request the completion of a "rule of thumb" form followed by a physical examination performed by a physiotherapist. Some general standards are needed along these lines. With the advances in dance/sports medicine and the research being done in the dance sciences, we now have available relatively easy-to-apply techniques for evaluation of individual body strengths and weakness. These techniques can assist in avoiding pitfalls, especially if those conducting auditions are constantly aware that they are not dealing with an object but a whole individual.

The advisability of such seemingly élite practices as testing protocol could be in conflict with "equal opportunities" legislation if it is not emphasised that the process is for the benefit and protection of both students and teachers.

The intention of appraising each prospective student's/dancer's physiognomy and physiology is to provide them with a realistic body image (in relation to the profession of dance) and evaluate the ability of the individual structure to tolerate the training load to which it will be subjected during education/training and a professional career.

Some general paradigm with regard to Cardiovascular Endurance, Anthropometry (body measurements) and Alignment could also be introduced in an endeavour to reduce injuries at a later date.

Cardiovascular endurance

It is recognized from research that a high Maximum Aerobic Capacity (M.A.C: the highest oxygen intake the individual can attain at sea level) is a positive factor in injury prevention. It therefore seems advisable to include a simple test for this at the audition, with the proviso that the required M.A.C. is still present at the beginning of the season or academic year.

Anthropometry

We are all aware that too much body weight is damaging to the hips and knees in some techniques. Anthropometry (body measurements, or Body Mass Index tests, or "O" scale tests) evaluates the relationship of height to weight. Such tests are in use at the Australian Institute of Sport, where the students themselves gradually take responsibility for the testing. It is a system which utilises skin-fold and girth measurements to help evaluate the effects of training on the physiognomy.

Alignment

Impaired postural balance affects the kinaesthetic sense - the ability to perceive what is happening. There is a subsequent reduction in the skilful performance of certain movements.

Although many experienced teachers have an eye for alignment it may be reassuring to know that there are several techniques used to screen posture alignment such as the grid, the plumb line, the pedograph and the podioscope (this last one you may have come across the last time you bought jogging shoes) A description of these techniques can be found in Arnheim's (1986) book.

Substance abuse

Some salient questions to applicants with regard to health, safety and self esteem would include "Do you have history of substance abuse?"

A **drug** is any substance that, when taken into the system of a living organism can modify one or more of its functions. That includes nicotine, alcohol, stimulants, appetite suppressants, sedatives, tranquillizers and anti-inflammatory drugs.

Although it would be naïve to expect complete revelations, the asking of such a question would reinforce in the mind of the applicant the dance community's attitudes on these issues with regard to health, safety and self esteem.

Even with the advent of testing protocols, there would still have to be consideration taken for the developing artist. Those in charge of schools and companies must help to create an awareness and an expectation that those responsible for the care of the dancer would be required to have a basic knowledge of functional anatomy and motor development or access and willingness to consult with someone who has.

We are aware that concepts and theories are also developing and it is now acknowledged that "changes in motor skill performance are age-related and occur throughout the entire life span".

The chronological age for various developmental periods is undergoing revision. Adolescence, it is conceded, can extend in girls to 18 years and in boys to 20 years. This has ramifications for the training of this group. i.e. too early subjecting of the skeletal structure of adolescents with differing growth rates to the functional stress of an advanced dance technique can have long-lasting negative effects.

In young adults, the diaphysis and epiphysis are separated by an epiphyseal cartilage or plate that provides the means for the bone to increase in length. In terms of training this means that the end of the bones where the tendons are attached are not fully developed and will not take the strain placed upon them if the adolescent is given adult roles too early.

Once accepted into the program/company, after extensive testing protocols, the teachers, ballet masters and choreographers (who have now taken responsibility for the development of the future artist) and the students/dancers themselves would be more fully aware of the physical limitations, muscle imbalance and vulnerable points (regarding training load, working hours and types of technique to be mastered.

Stressing the individual's limitations could be avoided, and work focused toward building on strengths. Such an attitude would in turn build individual self images and encourage dancers to accept and share the responsibility for care of themselves as instruments and artists.

The breadth of responses could include:

a) Types of testing protocol for the various components of conditioning and how it can be standardised.
b) Who will do the testing?
c) When and where will the testing be conducted?
d) Who will share in the results?
f) Who will take responsibility for the follow up?

References

- ARNHEIM, DANIEL D. (1986). *Dance Injuries. Their Prevention and Care.* (Dance Books: London).
- ASTRAND, P. & RODHAL, K. (1986). *Textbook of Work Physiology.* (McGraw-Hill).
- BUSWELL, J. (1985). The ABC of Body Care. *Dance and the New Zealand Experience. Papers and Proceedings.* (Auckland).
- CLARKSON, P. M. & SKRINNAR, M. (1988). *Science of Dance Training.* (Human Kinetics Books).
- HAYWOOD, KATHLEEN M. (1986). *Life Span Motor Development.* (Human Kinetics Publishers Inc.).
- RYAN, ALAN J, M.D. & STEPHENS, ROBERT E. Ph.D. (1988). *The Dancers Complete Guide to Health Care and a Long Career.* (Bonus Books: Chicago).
- SPENCE, ALEXANDER P. (1986). *Basic Human Anatomy.* (The Benjamin-Cummings Pub. Co. Inc.).

APPENDIX 2

SAMPLE OF PROFESSIONAL DANCERS' INJURY SURVEY FORM

AADE DANCE INJURIES SURVEY *

CONFIDENTIAL

PLEASE TICK APPROPRIATE REPLIES OR WRITE IN YOUR ANSWERS WHERE ASKED. IF YOU NEED MORE SPACE TO GIVE DETAILS, USE MORE PAPER, EMPLOYING THE SAME QUESTION NUMBERING.

PLEASE DO NOT WRITE IN MARGIN

1 (a) Have you ever sustained any injuries which were sufficient to affect your dancing in any way?

yes/no _____

Please give the number sustained, if possible _____

(b) Do you have any chronic (old) injuries which give you continuing problems? yes/no _____

Please give the number, if possible _____

What type of injuries were they? _____

_____

About how old were you the first time each one happened ? _____

_____

_____

(c) Have you sustained any injuries in the last six months which were sufficient to affect your dancing in any way? yes/no _____

IF YOU ANSWERED NO TO THE LAST QUESTION (1C), PLEASE TURN TO QUESTION 12. QUESTIONS 2 - 11 RELATE ONLY TO YOUR MOST RECENT INJURY WITHIN THE LAST SIX MONTHS.

DETAILS OF MOST RECENT INJURY SUSTAINED IN THE LAST SIX MONTHS

2 (a) How long ago did your most recent injury happen? (number of weeks or days) _____

(b) Where was the site of the injury? (eg hamstring, calf, arm etc) _____

(c) What sort of injury was it? (eg pulled muscle, sprain, shinsplint etc) _____

* This AADE project is assisted by the National Arts Industry Training Council. The Australian Association for Dance Education (National) is assisted by the Performing Arts Board of the Australia Council.

PAGE 2

PLEASE DO NOT WRITE IN MARGIN

3 Did the injury take place :

During class ☐
During rehearsal ☐
During a performance ☐
Elsewhere ☐

If during rehearsal, were you warmed up ?

yes/no _____

If elsewhere, please specify where _____

Were you on tour at the time? yes/no _____

If on tour, how long had you been away from home? _____

Did the injury occur within three weeks of resuming work after a break?

yes/no _____

4 If the injury occurred during a rehearsal or performance :

(a) What style/ technique was involved? _____

(b) Were you used to working in this style/ technique? _____

(c) Had you had the usual amount of rehearsal for the role?

yes/no _____

5 What, in your opinion, was the cause of the injury? (If you feel there were several factors contributing, list as many as you can think of, and tick those you consider the most important)

_____

_____

_____

_____

_____

_____

_____

PAGE 3

PLEASE DO NOT WRITE IN MARGIN

6 What did you do when you were injured?

Stopped dancing and rested ☐
Carried on as best you could ☐
Other ☐

If other, please specify _____

If you stopped and rested, for what period ? _____ hrs _____ days

7 Did you consult any of these professionals over the injury ?
(If you saw more than one, number the boxes in the order you approached them)

Osteopath ☐
Physiotherapist ☐
Acupuncturist ☐
Chiropractor ☐
Massage therapist ☐
General practitioner ☐
Specialist ☐
Other ☐

If other, please specify _____

If you consulted a medical doctor or specialist, was this privately or under Medicare?

Privately ☐
Medicare ☐

If privately, are you covered by an insurance scheme to help meet these costs ? yes/no _____

8 If help was sought (Question 7 above), how long after the injury was sustained did you see someone?

Number of days _____

If more than five days later, was this delay

For your own reasons ☐
Because you could not get an appointment sooner ☐
Other ☐

If other, Please specify _____

9(a) If help was sought (Question 7 above), were you offered any treatment ? yes/no _____

(b) What form of treatment was offered?

- Ultrasound ☐
- Infra-red treatment ☐
- Strapping ☐
- Manipulation ☐
- Massage ☐
- Exercises ☐
- Anti-inflammatory drugs or injections ☐
- Acupuncture ☐
- Other ☐

If other, Please specify _____

(c) Did you take the treatment offered? yes/no _____

If yes, was it helpful? yes/no _____

too early to say ☐

10 If treatment has been completed :

Has the site of the injury completely healed ? yes/no _____

If no, do you anticipate complete recovery ? yes/no _____

uncertain ☐

11(a) Were you given as much information about your injury as you wanted? yes/no _____

If no, what would you have liked to know more about? _____

_____

_____

11(b) If your injury was serious, were you able to get informed advice on any decisions you needed to make? yes/no _____

If yes, who provided this? _____

(c) After your injury, how many days went by before you could return to your normal workload? _____

12 Is there anything you consider important in the prevention of injury ? _____

_____

_____

Do you consider you have a good idea of what to do for yourself immediately you suspect you have an injury? yes/no _____

13 Please enter: (a) Your height _____ (cms) (b) Your weight _____ (kilos)

(c) Your year of birth _____ (d) Male ☐ Female ☐

14 At what age did you start intensive training? _____

Roughly how many hours per week did you dance at 13 ? _____

at 14 ? _____ at 15 ? _____ at 16 ? _____ at 17 ? _____

15 (a) In the last six months, have you performed in : (tick as many boxes as you need)

- the outback ☐
- country towns ☐
- capital cities ☐
- overseas ☐

If you toured in the last six months, what was your longest consecutive period away from home? _____

How many performances did you give in the above specific period ? _____

(b) During the longest consecutive period on tour, did any of the following affect you, mentally or physically? (mark the boxes with a tick for good effect, a cross for bad effect, a nought for no effect either way. Leave boxes blank if not applicable)

	physical	mental
change in sleeping patterns	☐	☐
change in eating patterns	☐	☐
change in exercise patterns	☐	☐
change in digestive patterns	☐	☐
change in climate	☐	☐
periods of travel	☐	☐

	physical	mental
extra jobs apart from dancing	☐	☐
required social duties	☐	☐
working in new places	☐	☐
living in new places	☐	☐
covering more roles than usual	☐	☐
other	☐	☐

If other, please specify: _____

16 Please describe your regular diet _____

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PLEASE DO NOT WRITE IN MARGIN

_____

_____

_____

Do you drink :	NEVER	SOMETIMES	A LITTLE REGULARLY	A LOT REGULARLY
tea/coffee	☐	☐	☐	☐
soft drinks	☐	☐	☐	☐
diet drinks	☐	☐	☐	☐
alcohol	☐	☐	☐	☐
Do you take :				
extra vitamins	☐	☐	☐	☐
health supplements	☐	☐	☐	☐
medications	☐	☐	☐	☐

What medications or remedies do you take most often?

non-prescription _____

prescription: _____

17 If female, have there been any times during your dancing career when your menstrual periods have been irregular?

yes/no _____

Have they ever ceased for more than 3 consecutive months apart from cases of pregnancy? yes/no _____

If you answered yes to either or both of the above, what do you think was the cause?

_____

_____

18 Do you have any personal comments to add? _____

_____

_____

_____

Please return survey form to: AADE National Co-ordinators, PO Box 287, Jamison ACT 2614 before July 21 1989. Thank you for your co-operation. The information gathered in this survey will assist in delivering eventual long-term benefits to all Australian dancers.

APPENDIX 3

Body therapies:

Below is a combined list, extrapolated from the writing of (1) B. Jencks (Table 6, p. 56) and (2) S. Fitt (Table 17.1, p. 296). This is not intended to cover the subject completely, but to offer a glimpse of what is available and a brief description of the content as described by these authors.

Outline of procedures and purposes of psychophysical methods.

1. Quoted from: Jencks B., Ph.D. *Biofeedback at its Best.* **2000 B.C. to the present, in approximately historical order**

"HATHA YOGA (India): Assumption of certain postures and control of breathing to increase vital capacity, flexibility and endurance, improve balance, strengthen internal organs, and induce altered states of consciousness.

TAI CHI (China): A series of stylized movement exercises, imitating certain aspects of nature, with the spine as a vertical axis and the centre of gravity in the lower abdomen, for improving balance, timing, coordination.

KUNG FU (China): Posture, breathing, and movement exercises to increase vital capacity, flexibility, muscular strength and endurance, improve balance, strengthen internal organs, and induce appropriate attitudes.

MAZDAZNAN (Persia): Breathing, body alignment, muscle tone, and movement exercises for the improvement of physical and mental health. (1800s0

ALEXANDER TECHNIQUE (F.M.Alexander, England): Proper alignment of head on spine to correct physical misalignments, attitudes, and behaviour. (1910s)

AUTOANLYSIS (D. Bezzola, Switzerland): Attention, with closed eyes, to and verbalization of successive internal sensations to induce deep mental and physical relaxation.(1910s)

PROGRESSIVE RELAXATION (E.Jacobson, United States): Alternate tensing and relaxing of skeletal, respiratory, forehead, eye, and vocalizing muscles to induce physical and mental relaxation. (1920s)

AUTOGENIC TRAINING (J.H.Schultz, Germany): Passive expectancy with closed eyes of sensations of heaviness and warmth in limbs, heartbeat, respiration, abdominal warmth, and coolness of the forehead for inducing relaxation and an altered state of consciousness in order to recondition the autonomic nerve system. (1920s)

SELF-MASSAGE AND SPORT MASSAGE (J.E.Ruffier, France, and H.Suren, Germany): Massage for relaxation, invigoration, muscle strengthening, elimination of wastes, etc. (1920s)

ACTIVE TONUS REGULATION (B.Stokis,. Netherlands): Ideomotor movements are used to prove the influence of the mind over the body; after eye closure suggestions for relaxation of muscles, respiration, and mind are used to induce am altered state of consciousness; if necessary, a hand is laid on a tense or sore body part. (1930s)

REICHIAN THERAPY (W.Reich, Germany): Release of chornic muscular tension, supposedly due to emotional "blocks," by breathing and psychotherapy to initiate abreactions which liberate energy and evoke memories. (1930s)

SENSORY AWARENESS TRAINING (E.Grindler, Germany): Paying deliberate attention to bodily functions, perceptions, and sensations, to improve reality-relatedness, calmness, composure, and self-possession in everyday life. (1930s)

Since the 1940s

DYNAMIC TENSION (C.Atlas, United States): A training course utilising movement, breathing, diet, the imagination, and especially muscle tension produced by the pressure or pull of one body part against another, for building strong and healthy tissues, increasing and storing energy, and "cultivating a better self."

BIOENERGETICS (A.Lowen, United States): Body movements and verbalizations to release blocked or repressed energy and integrate body and mind.

GESTALT THERAPY (F.Perls, United States): Use of sensory, muscular, emotional, and visceral experimentation to increase awareness of physical and mental processes.

FUNCTIONAL RELAXATION (M. Fuchs, Germany): Slow, relaxed exhalation for differential relaxation of body parts and systems and a relaxed breathing rhythm.

PASSIVE MOVEMENTS (L.Michaux, France): Completely relaxed, unresisting cooperation while another person slowly moves joints or limbs, upper spine, and head to induce deep physical and mental relaxation.

EUTONY (G.Alexander, Denmark): Repeated sensing and adjusting of muscle tensions during rest and movement to produce optimal balance of muscle tone in the body.

AWARENESS THROUGH MOVEMENT (M.Feldenkrais, Israel): Movements involving limbs, breathing, facial expressions, etc. are used as bases for sensory training and self-improvement.

STRUCTURAL INTEGRATION (I.P.Rolf, United States): Manipulative force if applied to stretch and lengthen body connective tissue in order to align the body along its vertical axis.

LYMPH DRAINAGE MASSAGE (E. Vodder, Denmark): Lymph drainage massage is applied along the lymph channels to remove waste deposits from the system and improve general well being.

RESPIRATION FOR SPECIAL ACCOMPLISHMENT (BJencks, United States): The exhalation and inhalation phases are coupled with the imagination to enhance respectively relaxation or invigoration, warmth or coolness, equanimity or courage, etc. for use in daily life activities and coping with stress.

RELAXATION RESPONSE (H.Benson, United states):Mental, Aural, or visual fixation, an attitude of passive expectancy, a relaxed posture, and a quite environment with optimal eye closure are used to induce a relaxed state with the responses of parasympathetic nervous system dominance.

PSYCHOGYMNASTICS (H. Junova and F.Knocblock, Canada): Movement, relaxation and an enhanced consciousness of the body's orientation in space are used for increasing sensory awareness and for spontaneous expression of a given theme in pantomime.

TERPSICHORETRANCETHERAPY (D.Akstein, Brazil): Aural stimulation by drums and music and vestibular stimulation by movement of the head and rotation of the body are used to induce a kinetic altered state of consciousness which results in relief of emotional tensions. "

2. Quoted from Fitt, S., *Dance Kinesiology.*

"CONSTRUCTIVE REST POSITION(CRP) and IDEOKINESIS: Lulu Sweigard's approach to relaxation differs from Jacobson's in its extensive use of imagery and imagined action (ideokinesis). Subjects assume the constructive rest position (CRP) Lying on one's back with the knees bent, flat feet on the floor, and knees dropped together. The arms are wrapped across the chest (as if one is holding onto the opposite shoulder, but the hands held in a relaxed fashion). While in the CRP, the instructor takes the participant through a series of imagined actions designed to facilitate a relaxed state and

motional efficiency. Graphic images are the hallmark of Sweigard's work with relaxation.

MEDITATION: One focus of any meditation technique is the clearing of the mind. In the process, there is a relaxation of the musculature which may or may not be the focus of a particular meditation exercise.

ROLFING: Rolfing (developed by Ida Rolf) is a technique of deep tissue massage which includes ten one-hour sessions. Each session focuses on a specific body area. The massage is very deep. quite painful for some subjects, and reportedly effective in radically changing the tension patterns of the subject. The change is so rapid that the subjects frequently report a physical disorientation. In order for the effects of Rolfing to last over a period of time, the subject (just as with other techniques) must invest time and energy in changing his or her habit patterns that the caused the tension to build in the first place.

APPLIED KINESIOLOGY/TOUCH FOR HEALTH/ GOODHARDT THERAPY: This technique is based of the theory of energy meridians (acupuncture/acupressure) and the linking of specific muscles groups with certain meridians. Muscle testing for strength is followed by acupressure to increase the strength of weak muscles and decrease the strength of strong muscles to create an evenly balanced muscular system. Holistic health of the entire system is also a focus of this technique.

POSTUROLOGY/REFLEXOLOGY: Postural problems, health problems and muscular imbalances are approached through foot massage. Practitioners of this technique base their work on the theory that all parts of the body are represented in specific areas of the foot.

POSTURAL INTEGRATION: Deep tissue massage focuses on areas of high tension and muscular imbalance. Some say this technique is similar to Rolfing but practitioners of the two techniques do not agree. BIOFEEDBACK: Electromyographic equipment is used to give feedback to the subject

on the electrical activity of the musculature. The immediacy of feedback and the objectivity of the measure of tension are the outstanding features of biofeedback techniques.""

Other

BODY CONTROL (Joseph Pilates): Practitioners of this method base their work of the theory that by isolating certain muscles groups no unnecessary energy is expended. In this way maximum performance is being achieved through focused effort on specific muscles, thereby improving muscle balance, flexibility, coordination and strength.

BARTENIEFF's FUNDAMENTALS. (Irmgard Bartenieff): is an evolving series of movement sequences that deal with mobilising the body efficiently in its environment and preparing it to perform as wide a range of movement qualities and shapes as possible. (Martha Myers, Dance Magazine 1983).

DANCE THERAPY: a body-based psychotherapy in which the basic element is the moving body coping with force, time, space and flow. It is rooted in the firm belief that dance as a creative art is a powerful tool that can be used for preventative care, diagnostic assessment and therapeutic rehabilitation.

MARTIAL ARTS: any of the various sports or fighting skills, mainly of Far Eastern origin, such as Kung Fu, Judo, Karate, Kendo and Tang Soo.

APPENDIX 4

Participants in meetings for the project with whom group or individual consultations were held

Tony Geeves, Project Officer

Canberra, A.C.T. - September 14, 1989

Julie Dyson, Janet Karin, O.A.M. and Hilary Trotter (Chair) (Project Management Committee). First of a series of meetings held throughout the course of the project.

Sydney , N.S.W. - September 25 - 29, 1989

Co-ordinator: Catherine Beall (AADE, N.S.W.)

Valda Craig (Dance Educator, Catholic College of Education Sydney), Keith Bain, O.A.M. (N.I.D.A)

Murray Brown (Executive Officer N.A.I.T.C.)

Marion Jacka (Actors' Equity)

Greg Schneider (Physiotherapist)

Joan & Monica Halliday (Studio Teachers)

Margaret Markham (Dean, McDonald College) Reall Isacowitz (Dance, Pilates Teacher), Wes Battams (Director, Cumberland College of Health Sciences)

Dr. Ken Crichton (Sports Physician, Consultant to the Australian Ballet)

Adelaide , S.A .- October 11, 1989

Co-ordinator: Roger Pahl (AADE S.A.)

Les Wilhelm (R.A.D.), Robynne Garrett (ACHPER Dance Dir. Co-ordinator S.A.), Rosemary Bennett (AADE President, Dance Curriculum Officer, S.A. Ed.Dept.), Leigh Warren (Artistic Director, ADT),

Nicole Vass (physiotherapist, dance injuries specialist), Sally Patterson (Outlet Dance Company)

Meredith Anthoney (dance methodologist,S.A. C.A.E.), Anita Donaldson (Course Co-ordinator, S.A. C.A.E.), Patricia Wallis-Smith (A.C.H.P.E.R.)

Brian Debnam (Director, C.P.A.)

Ron Smith (physiotherapist, Feldenkrais instructor)

Dr. John White (University Health Services)

Brisbane, Queensland October 26- Nov 1, 1989

Co-ordinator: Julie Chenery, A.A.D.E. (QLD)

B.C.A.E., Kelvin Grove, Dance Department staff : Susan Street, Shaaron Boughen, Robert Osmotherly, Graeme Collins, Sue LeClerq, Kristin Bell

Harold Collins (Artistic Director, Queensland Ballet)

Ron Adie (Senior Lecturer in Psychology, B.C.A.E.)

Frank Pyke (Professor, Department of Human Movement, Queensland University)

Jacqueline Moreland, Administrator, R.A.D. (Q'ld)

Kathryn Lowe-Henricks (Australia Council, P.A.B.)

Robert Osmotherly, dance educator

Robin Czislowski (ballet teacher), Margaret Smith (sports medicine practitioner), John Fitzerald (physiotherapist), Ron Adie (psychologist), Robert Osmotherly (dance educator), Holly Frail (dietitian), Susan Street (dance educator), Graeme Collins (dance educator), Wendy Morrow (dance educator), Gordon Lulnam (Performing Arts Medicine Society), Cheryl Ellison (physiotherapist), Victor Popov (physiotherapist), Julie Campbell (physiotherapist), Linda Lewis (physiotherapist), Angus Lugsdin (Director, Q.D.S.E., choreographer/teacher), S.F. Yates (medical practitioner),

Shaaron Boughen (dance educator), Julie Chenery (arts administrator), Wayne McKenna (Administrator, Queensland Ballet), Julie Dyson (A.A.D.E. National)

Melbourne, Victoria. November 13-18, 1989

Co-ordinator: Mark Gordon, A.A.D.E. (Vic)

Helen Cameron (dance educator), Hilary Crampton (Course Director, Victoria College, Rusden), Modesta Gentilé (Company Manager, The Dancers Company), Laurel Martyn (dance teacher), Shirley McKechnie (dance educator), Craig Phillips (physiotherapist, Pilates instructor), Sarah Way (physiotherapist)

Ronald Quirk, F.R.C.S., F.R.A.C.S. (Consultant to the Australian Ballet)

Studio teachers:
Gay Wightman, Grace Constable, Helen Longo, Christine Waters, Hilary Crampton. Melinda Digger, Mandy Masterson, Sebastian Riscica, Janet Keyte, Karen Ermacora, Melanie Beskowitch, Ruth Lane

Dame Margaret Scott, D.B.E. (Director, Australian Ballet School), Dr Pam McQueen (Physician, Australian Ballet School)

Jonathan Taylor (Dean, School of Dance, Victorian College of the Arts)

Craig Phillips, (Dance Medicine Australia Clinic)

Canberra , A.C.T. November 1989

Co-ordinator: Jennifer Kingma (A.A.D.E. A.C.T.)

Meryl Tankard (Artistic Director, Meryl Tankard Company)

Peter Stanton (physiotherapist, A.I.S.)

Mark Spargo (sports psychologist, A.I.S.)

Greg Blood (Librarian, A.I.S.)

Pip Pang, Deborah Kerr (physiologists and nutritionists, A.I.S.)

Michael Stenning (Alexander practitioner)

Pamela Brown (Iyengar Yoga instructor)

David Hill (T.A.F.E. College)

Sydney, N.S.W., - December 10, 1989

Lyn Ralph (Company Manager, Sydney Dance Company)

JOINT MEETING OF THE NATIONAL COUNCIL OF TERTIARY DANCE DIRECTORS AND ARTISTIC DIRECTORS OF DANCE COMPANIES, Sydney, December 12, 1989

**denotes presenters of papers at the meeting*
˚denotes absence from part(s) of the meeting

Directors and their representatives:
Alan Alder, Head of Dance, W.A. Academy of Performing Arts, Pamela Buckman*, Queensland Ballet (representing Harold Collins, Artistic Director), Valda Craig, Chair, National Council of Tertiary Dance Directors, Hilary Crampton*, Course Director, Rusden, Brian Debnam, Director, Centre for Performing Arts, Anita Donaldson, Course Co-ordinator, S.A. C.A.E., Russell Dumas*, Artistic Director, Dance Exchange, Isobel Gabriel, Director, Box Hill College of T.A.F.E., Maina Gielgud* ˚, Artistic Director, the Australian Ballet, Anne Greig, Course Director, Aboriginal/Islanders S.D.A., Derek Holtzinger˚, Artistic Director, 2Dance Plus, Helen Herbertson, Joint Artistic Director, Dance Works, Colin Peasley, (representing Dame Margaret Scott, Director, Australian Ballet School), Lucinda Sharpe, W.A. Ballet (representing Barry Moreland, Artistic Director), Beth Shelton, Joint Artistic Director, Dance Works, Maggie Sietsma˚, Artistic Director, Expressions Dance Company, Jacqueline Simmonds, Course Director, University of Western Syd-

ney, Cheryl Stock, Artistic Director, Dance North, Susan Street*, Course Co-ordinator, Brisbane C.A.E., Jean Tally, Artistic Director, Still Moves, Ann Thompson, Melbourne University (representing I.E.C.D.), Leigh Warren**, Artistic Director, Australian Dance Theatre

Observers:
Libby Dempster*, Deakin University, Reyes de Lara, W.A. Academy of Performing Arts

In attendance:
Ron Adie, Brisbane C.A.E. (Meeting Chairman), Julie Dyson, National Executive Officer, A.A.D.E., *Tony Geeves, Safe Dance Officer, A.A.D.E., Nanette Hassall, P.A.B. Dance Panel, Hilary Trotter* National Executive Officer, A.A.D.E.,
Ronne Arnold*, Sydney University, Kristen Bell*, Brisbane C.A.E., Keith Bain, National President, A.A.D.E., Kathryn Lowe-Henricks*, member, Performing Arts Board.

Townsville, Queensland - January 21, 1990

Co-ordinator: Lorna Hempstead (General Manager, Dance North)

Cheryl Stock (Artistic Director, Dance North).

Studio teachers:
Sandra Kuhn, Olive Fairclough, Julia Macalpine, Donne Moule, Joanne Ross, Debbie Costigan, Lenore Nielson, Joyce Butler, Nola Gardner, D'estey Smith, Ann Roberts, O.A.M.(R.A.D. Examiner)
Physiotherapists:
Bobbie Cox, Heather Harvey, Rose Cermak, Helen Devine,
Medica l practitioner:
Lyndel Cahill

Darwin, Northern Territory - January 25-26, 1990

Co-ordinator: Jan Miller-Kennett, A.A.D.E. (N.T.)

Neil McCormack (Physical Education and Health), Hilary Press (Aerobics), Linda Ashton (Teacher

Education), Jenni Judd (Health and Drug Education).

Heather MacGowan, Ph.D. (Officer of Youth, Sport Recreation and Ethnic Affairs)

Barbara Pitman (Multicultural Arts Officer, Migrant Resource Centre), Maggi Phillips (dance teacher and choreographer), Barbara Beamsley (A.A.D.E.), Steven Gration (Artistic Director, Corrugated Iron Youth Theatre), Jenny Milne (folk dance), Bev Cowan (studio teacher), Jan Hedenig (studio teacher), Sue Ross (community, folk and bush dance), Stephen Farrawell (ballroom dance teacher), Margaret Black (teacher, ballroom education).

Brown's Mart Community Arts Project: Leonie McNally, Barbara Pitman, Ingrid Hoffman, Bruce Campbell, Bill Searle, Steve Anderson, Chris Downie, Martin Hardie, Ken Conway, Steven Gration, Jan Miller-Kennett, Mary Wansey

Penny Kerr, A.A.D.E. (N.T.)

Perth, Western Australia - February 4-8, 1990

Co-ordinator: Jody Burton, A.A.D.E. (W.A.)

Jan Dolinski (studio principal), Barb Leighton (dance teacher, Lyrical Movement Dance School) Christine Herbert, Christopher Herbert (dance student), Mady Colquhoun (dance teacher), Kerryn Aarland (Highland Dance teacher), Sherylyn Grieve (Highland Dance student), Colleen Newman (classroom teacher/dance specialist), Irina Norris (Irina Asotoff Ballet School), Toni Mason (dance teacher, Contemporary Dance Centre), Marika Sackett (dance teacher, Hungarian Folk Dance Association), Joan Pope (A.A.D.E. past president, A.C.H.P.E.R. Co-ordinator, National Committee, Dalcroze Eurhythmics, Lecturer, Curtin University, music and movement), Colleen Ryan (Highland Dance student teacher), Jill Perry (Margaret Morris Movement Teacher), Valmae Clark (music and dance teacher), Belyssa (Belyssa Belly Dancing Academy)

Grant Donovan (Ministry of Sport and Recreation W.A), Jeanette Meakins (Aerobic Institute of Western Australia)

Barry Moreland (Artistic Director, W.A. Ballet), Lucinda Sharp (Assistant Artistic Director, W.A. Ballet.)

John Leebold (osteopath and Iyengar Yoga Teacher), James Morgan (Diploma Performing Arts and Yoga teacher)

Secondary Education Authority: Penny Why (Actors' Movement), Trin Stewart (Curriculum Development and Moderation Officer for Dance, Secondary Education Authority Physical Education, Health Studies), Dr. Lynn Embrey (Vice President, A.C.H.P.E.R.), Richard Stewart (Master's student, University of W.A., Department of Human Movement), Betty Rose (Ph.D. student, University of W.A., Department of Human Movement, Recreation and Sport)

A.A.D.E. (W. A.) Committee: Ruth Osborne (President), Brett Roberts (Vice President),David Lamb (Treasurer), Lynn Fisher, Reyes de Lara, Gary Hill

Graham Taylor (Architect: Harms, Scharley-Architects)

Jim Hughes (Movement and Drama)

Western Australian Academy of Performing Arts: Alan Alder (Head of Dance Department), Lucette Aldous, Jane Diamond, Mark Annear, Reyes de Lara, Shelley Rae, John Mc Laughlin

Ken Eastwood (Consultant, Department of Sport and Recreation W.A.), Alice Cummings, Wenda Pachard, Annette Barrow, (Leaders, Prime Movers)

Francis Giles (Promotion Officer, W.A. Gymnastics Association)

Ann Clarke (Department of Human Movement, University of W.A.)

Doug Joyce, Bill Vincenzio, Dorothy Ritchie, David Maloney, (physiotherapists), Toni Mason, Deborah Kerr, (dieticians), Craig Turner (physician in general practice), Jody Burton (Executive Officer, A.A.D.E. W.A),Colin Haydock

Launceston , Tasmania-February 9, 1990

Co-ordinator: Lesley Graham, A.A.D.E. (Tas)

Jennifer Kinder (Artistic Director, TasDance), Anna Smith (dance educator), Lewis Lampton (dancer), Callum Cowell (dancer and teacher), Beth Parsons (C.D.E., Education Department), Helene Boyer (dance teacher), Joanne Ocherby (dance teacher), Tania McNear (dance student), Allison Gibson (dance teacher and student), Neil Adams (Rehearsal Director, TasDance), Cameron Wallace-Mitchell (dancer and teacher)

Hobart , Tasmania-February 10, 1990

Co-ordinator: Lesley Graham, A.A.D.E. (Tas)

Paul Bourke (Aerobics instructor), Heather Knight (physiotherapist), Hazel Maddox (studio teacher), Jeanette Marshall (dance teacher), Michele Walters (dance teacher), Lesley Graham (dance educator), Margaret Long (Alexander teacher), Carolyn Owen (speech and drama teacher)

Sydney, N.S.W. - March 25, 1990

Final Seminar

Co-ordinators: A.A.D.E. National Officers

Valda Craig (Chair) (Lecturer, Catholic College of Education, National Vice President, A.A.D.E.), Julie Dyson (National Executive Officer, A.A.D.E.), Ann Clarke (Department of Human Movement and Recreation Studies, University of W.A.), Dr. Ken Crichton (sports physician, Consultant to the Australian Ballet), Janet Karin, O.A.M. (Director, National Capital Ballet School), Colin Peasley (Répétiteur Géneral, Australian Ballet), Helen

Cameron Davies (Lecturer in Education Studies, V.C.A.), Jacqueline Simmonds (Lecturer in Charge, Dance Department, University of Western Sydney), Marion Jacka (Actors' Equity of Australia), Reall Izacowicz (dance teacher, Pilates practitioner, McDonald College), Lyn Ralph (Company Manager, Sydney Dance Company), Robina Beard (Cecchetti N.S.W.), Catherine Beall (Director, A.A.D.E. N.S.W.), Anne Greig (Course Director, National Aboriginal Islander Skills Development Association, President, A.A.D.E. N.S.W.), Keith Bain O.A.M. (Movement Director, N.I.D.A., National President A.A.D.E.), Stephanie St Clair (freelance dancer, Alexander practitioner), Monica Miland (N.S.W. Department of Education), Helen O'Connor (nutritionist), Peter Green (osteopath), Craig Phillips (Director, Dance Medicine Australia), Nicole Vass (physiotherapist), Margaret Chapple (Director, Bodenwieser Dance Centre), Dr. Millons (general practitioner, Consultant to Sydney Dance Company)

SAFE DANCE ADVISORY PANEL MEMBERS

Alan Alder (Head of Dance, W.A. Academy of Performing Arts)

Lucette Aldous (Dance Lecturer, W.A.A.P.A.)

Keith Bain, O.A.M. (A.A.D.E. National President, Movement Director, N.I.D.A.)

Wes Battams (Sports Injury Prevention Program, Cumberland College of Health Sciences)

Catherine Beall (Director, A.A.D.E. N.S.W.)

Helen Cameron Davies (Lecturer in Education Studies)

Valda Craig (Chair, National Council of Tertiary Dance Directors)

Dr Ken Crichton (Sports Physician, Consultant to the Australian Ballet)

Dr Hunter Fry (Performing Arts Medicine Society)

Marion Jacka (Actors' Equity of Australia)

Douglas Joyce (Physiotherapist, W.A. Ballet)

Janet Karin , O.A.M. (Director, National Capital Ballet School)

Steve Kossa (Biomechanics Lecturer, Tasmanian Institute of Technology)

John McAuliffe (Musicians' Union)

Kathryn Lowe Henricks (Performing Arts Board, Australia Council)

Helen O'Connor (Nutritionist)

Judith Osbourne (Phillip Institute of Technology)

Noel Pelly, A.M. (General Manager, Australian Ballet)

Joan Pope (National Dance Co-ordinator, Australian Council for Health, Physical Education and Recreation)

Craig Phillips (Physiotherapist, Dance Medicine Australia)

Ronald Quirk , F.R.C.S., F.R.A.C.S. (Consultant to the Australian Ballet)

Lyn Ralph (General Manager, Sydney Dance Company)

Greg Schnelder (physiotherapist)

Meryl Tankard (Artistic Director, Meryl Tankard Company)

Marion Tye (kinesiologist, W.A. College of Advanced Education)

Nicole Vass (physiotherapist)

Leigh Warren (Artistic Director, Australian Dance Theatre)

Sarah Way (physiotherapist)

APPENDIX 5

Code of ethics for the dance teaching profession

This code has been devised by leading representatives of Australia's studio teachers to inform teachers and the public of the ethical standards expected by the profession of its practitioners.

1. Clearly defined aims will be stated by studio principals, setting out the broad goals to be achieved by the school. A similar set of objectives will be stated which outlines the benefits a pupil can expect to receive through the teaching staff's conscientious implementation of them.

2. Studio principals will ensure that their school is capable of providing any services claimed.

3. Studio principals will employ teaching staff with the experience, knowledge and qualifications required by the levels and techniques to be taught. Student teachers will be trained and supervised to ensure maintenance of the school's teaching standards.

4. Studio principals will provide appropriate assessment procedures and will ensure that students and parents receive or have access to advice when necessary.

5. Studio principals will conform to sound business practice and provide an efficient fee system.

6. Studio principals and individual teachers will ensure that classes are of a size appropriate to the levels and techniques being taught. Students in each class will be of a compatible age and standard.

7. Studio principals and individual teachers will ensure that facilities provided:

- conform with minimum safety and space requirements

- have suitable flooring, with a safe surface designed and constructed to minimise risk of injury

8. Individual teachers will use adequate and flexible teaching skills to create a productive learning environment. Individual teachers will:

- strive to communicate a love of dance
- demonstrate professional attitudes, including punctuality, reliability and responsible care of students
- strive to develop self-discipline and self-motivation in the students
- encourage and support the individual in the class situation
- transmit general concepts of movement in addition to those of a particular dance style.

9. Individual teachers will recognise the role of dance in the development of the whole person. They will also seek to recognise and develop each student's potential, whether it lies in dance or in related fields, and offer appropriate guidance for further progress.

10. Individual teachers will endeavour to recognise physical anomalies, modifying the teaching and seeking medical advice when necessary. The teaching and choreography must be anatomically safe, and teachers must be prepared to deal with medical emergencies.

11. Individual teachers will strive to develop in the students an appreciation of the characteristic style of each specific technique taught.

12. Individual teachers will take responsibility for seeking further knowledge in all aspects of their work.

APPENDIX 6

Database of Documents on Dance Injury, Collected by Anne Slaney and Compiled by Shelley Noakes.

DANCE INJURY - GENERAL

ALTER, MICHAEL J. (1988) *Science of Stretching.* Human Kinetics Publishers : Australia.

ANDERSON, B. (1980) *Stretching.* Shelter Publications Inc: California.

ARNHEIM, D. (1986) *Dance Injuries, Their Prevention and Care.* Dance Books: London.

BAR-OR(1983) *Pediatric Sports Medicine.* Springer Verlag New York Inc: New York.

CLARKSON, P M. & SKRINNAR M (1988) *Science of Dance Training.* Human Kinetics Publishers (Aust)

DIRIX, A (1988) *The Olympic Book of Sports Medicine,.* Blackwell Scientific Publications: Carlton.

DOWD, I. (1981) *Taking Root to Fly. Contact Collaborations,* New York.

EGGER, G. & CHAMPION, N. (1986) *The New Fitness Leader's Handbook,. Kangaroo Press: Kenthurst.*

The Fitness Leader's Exercise Bible. Kangaroo Press: Kenthurst.

FITT, S. (1982) "The Science of Human Motion as a Foundation for the Art of Dance", *Proceedings of National Scientific Conference A.S.M.F, Proceedings of National Scientific Conference*: Ballarat.

FITT, S. (1988) *Dance Kinesiology.* Schirmer Books, New York.

GELABERT, R. (1977) "Dancers and medical science". *Dance Magazine*, December: pp. 74-76

"Turning out". *Dance Magazine*, February: pp. 86-87.

"The dancer's physique". *Dance Magazine*, November: pp. 78-79.

"The myth of dance-induced pain". *Dance Magazine*, May: pp. 96-97.

GOLDBERG, B., WITMAN, P. A., GLEIM, G.W., NICHOLAS, J. A. (1979) "Children's sport injuries: Are they avoidable?". *The Physician & Sports Medicine*, Vol. 7 No. 9: pp. 93-101.

HAMILTON, W.G. (1978) "Ballet and your body: an orthopaedist's view". *Dance Magazine*, August: pp. 81-83.

HASKELL, W., SCALA, J., WHITTAM, J. (eds) (1982) *Nutrition and Athletic Performance,*. Bull Publishing Company: California.

HOLT, L.E. (1981) *Scientific Stretching for Sport.* The Coaching Association of Canada: Canada.

HOWSE, J. & HANCOCK, S. (1988) *Dance Technique and Injury Prevention.* A & C Black: London. Distributed in Australia by Hodder and Stoughton.

LAIRD, B. (1985) "The Results of a Study of 2800 Dance Injuries". *Proceedings of National Scientific Conference,* A.S.M.F: Ballarat.

LAWS, K. (1985) *The Physics of Dance.* Schirmer Books: New York.

MICHELI, L.J. (1983) "Overuse injuries in children's sports: The growth factor". *Orthopaedic Clinics of North America.*. Vol. 14, No.2: pp. 337-360.

MICHELI, L.J., KASSABIAN, K., ESTHER ANN, G., KIRKPATRICK, J., LECHAPRIER, L., (1982) "Sports in childhood - A round table". *The Physician and Sports Medicine Book*, Vol 10: pp. 53-60.

MCARDLE, W.D., KATCH, F.I., KATCH, V.L. (1981) *Exercise Physiology: Energy, Nutrition, and Human Performance. Lea and Febiger: U.S.A.*

NEWHOUSE, I. (1986) "Overtraining". *Coaching Review,* July: pp. 52-56.

OGDEN, J.A. (1982) "Skeletal growth mechanism injury patterns". *Journal of Paediatric Orthopaedics,* Vol. 2 No. 4: pp. 371-377.

ORAVA, S. & SAARELA, J. (1978) "Exertion injuries to young athletes". *American Journal of Sports Medicine*, Vol. 6, No. 2: p 68-74.

OSBOURNE, J. (1986) "Sources of Inspiration for Dance Education Curricula: Approaches from the Arts and Sciences". *Proceedings for Dance, ACHPER: Launceston.*

RYAN, A J & STEPHENS R E. (1988) *The Dancer's Complete Guide to Health & a Long Career.* Bonus Books, Chicago

SHELL, C. (ed) (1984) *The Dancer as Athlete.* Human Kinetics: Champaign.

SPARGER, C. (1958) *Ballet Physique.* A. and C. Black Ltd, London: pp. 46-53.

TIMMS, A. (1983) "Rehabilitating Injured Dancers". *Proceedings of Dance Medicine Seminar, Duke University.* Durham.

VINCENT, L. (1980) *The Dancer's Book of Healing.* Dance Books: London.

WATSON, G. (1979) "Some Psycho-Social Aspects of Athletic Injury". *Sports Coach,* Vol.3, No.2.

EMBRYOLOGY

CRELIN, S., & NETTER, H. (1981) "Development of the Musculoskeletal System". *Clinical Symposia,* Vol 33, No.1: CIBA Pharmaceutical Co, Summit, New Jersey.

CRELIN, S. & NETTER, H. (1974) "Development of the Nervous System". *Clinical Symposia,* Vol. 26, No.2: CIBA Pharmaceutical Co., Summit, New Jersey.

MOORE, K. (1983) *Before We Are Born.* 2nd Edition, W.B. Saunders Co: Philadelphia, PA.

ANATOMY

CLEMENTE, CARMINE D. (1981) *Anatomy, A Regional Atlas of the Human Body.* 2nd Edition, Urban & Schwarzenberg: Baltimore-Munich.

GORMAN, D. (1981) *The Body Moveable.* Ampersand Printing Co: Ontario, Canada.

GRAY, H. & GOSS, C. (1973) *Gray's Anatomy.* Lea & Lebiger: Philadelphia.

HOPPENFELD, STANLEY. *Physical Examination of the Spine & Extremities.* Appleton-Century-Crosts: ISBN 0-8385-7853-5

KAPIT, W. & ELSON, L. (1977) *The Anatomy Coloring Book.* Harper & Row Inc: New York.

NETTER, H. (1983) "The Nervous System". *The CIBA Collection of Medical Illustrations,* Vol.1: CIBA Pharmaceutical Co., West Caldwell, New Jersey.

MOTOR DEVELOPMENT

AYRES, JEAN A. *Sensory Integration and the Child.* Western Psychological Services: 12031 Wilshire Boulevard, Los Angeles, CA 90025. ISBN 0-87424-158-8.

FIORENTINO, M. & THOMAS, C. A *Basis for Sensorimotor Development, Normal & Abnormal.* Springfield, Illinois, 1981.

Reflex Testing Methods for Evaluating CNS Development. 2nd Edition: Springfield, Illinois, 1973.

HEINEMANN, W. (1975) *The Development of the Infant, The First Year of Life in Photographs.* W. Heinemann Medical Books Ltd: London, England, ISBN 0-433-032235-9.

MOORE, JOSEPHINE C. *Growth & Development of the Nervous System in Relation to Movement.* Department of Anatomy, University of South Dakota, School of Medicine, Vermillion, South Dakota, 57069.

SPINE AND LOWER EXTREMITIES

BACHRACH, R.M. (1986) "Diagnosis and management of dance injuries to the lower back: an osteopathic approach". Olympic Scientific Congress (1984: Eugene, Oregon). In, Shell, C.G. (ed.), *The Dancer as Athlete.* Human Kinetics Publishers: Champaign, Ill: pp. 83-90.

CLIPPINGER-ROBERTSON, K.S., HUTTON, R.S., MILLER, D.I., NICHOLS, T.R (1986) "Mechanical and anatomical factors relating to the incidence and etiology of patellofemoral pain in dancers". Olympic Scientific Congress (1984: Eugene, Oregon). In, Shell, C.G. (ed.), *The Dancer as Athlete,* Human Kinetics Publishers: Champaign, Ill: 53-72.

GELABERT, R. (1986) "Dancers' spinal syndromes". *Journal of Orthopaedic and Sports Physical Therapy* (Baltimore, Md.), 7,4, Jan 1986: 180-191.

KELLY, R. (1985) "Lower leg & ankle problems associated with dance". *Journal of the Canadian Athletic Therapists Association,* vol 12, no. 1, Summer: 5-9

KRAVITZ, S.R., MURGIA, C.J., HUBER, S., SALTRICK, K.R. (1986) "Biomechanical implications of dance injuries". Olympic Scientific Congress (1984: Eugene, Oregon) In Shell, C.G. (ed.), *The*

Dancer as Athlete, Human Kinetics Publishers: Champaign, Ill.

MICHELI, L.J. (1983) "Back injuries in dancers". *Clinics in Sports Medicine*, (Philadelphia) 2(3), Nov: 473-484.

"Back injuries in dancers". Olympic Scientific Congress (1984: Eugene, Oregon) In, Shell, C.G. (ed.), *The Dancer as Athlete*, Human Kinetics Publishers: Champaign, Ill: 91-94.

MILLER, E.H., & BENEDICT, F.E. (1985) "Stretch of the Femoral Nerve in a Dancer". *Journal of Bone & Joint Surgery*, American edition (Boston) 67(2) February.

NICHOLAS, J.A. & HERSCHMAN, E.B. (1986) "The Lower Extremity and Spine in Sports Medicine". Mosby: St Louis, Mo.

NIXON, J.E. (1983) "Injuries to the neck and upper extremities of dancers". *Clinics in Sports Medicine* (Philadelphia), 2(30, Nov: 459-472.

REID, D.C, BURNHAM, R.S., SABOE, L.A., KUSHNER, S.F. (1988) "Lower extremity flexibility patterns in classical ballet dancers and in their correlation to lateral hip and knee injuries". *Physiotherapy in Sport, (London)*, 11,1, Feb: 4-7.

"Lower extremity flexibility patterns in classical ballet dancers and their correlation to lateral hip and knee injuries". *American Journal of Sports Medicine* (Columbus, Ga.), 15, 4, Jul/Aug 1987: 347-352.

SAMMARCO, G.J. (1983) "The dancer's hip". *Clinics in Sports Medicine* (Philadelphia), 2(3), Nov: 485-498.

SILVER, D.M & CAMPBELL, P. (1985) "Arthroscopic assessment and treatment of dancers' knee injuries", *Physician and Sports Medicine* (Minneapolis) 13(11) November.

TEITZ, C.C. (1986) "First aid, immediate care, and rehabilitation of knee and ankle injuries in dancers

and athletes, Olympic Scientific Congress (1984: Eugene Oregon) In, Shell, C.G. (ed.), *The Dancer as Athlete,* Human Kinetics Publishers: Champaign, Ill: 73-81.

WARREN, M.P., BROOKS-GUNN, M.D., HAMILTON, L.H., WARREN, L.F., HAMILTON, W.G. (1986) "Scoliosis and Fractures in Young Ballet Dancers". *The New England Journal of Medicine*, May 22, 314(21): 1348-53.

WEIKER, G.G. (1988) "Dance injuries: the knee, ankle, and foot". In Clarkson, P.M. & Skrinnar, M. (eds.), *Science of dance Training,* Human Kinetics Books: Champaign, Ill: 147-192.

WOHLFAHRT, D.A., & BULLOCK, M.I. (1983) "Turn out in ballet, and its effect on the knee joints". In Howell, M.L. & Bullock, M.I. (eds.), *Physiotherapy in Sport,* University of Queensland, Dept of Human Movement Studies: St. Lucia, Qld: 77-81.

WRIGHT, S. (1985) *Dancer's Guide to Injuries of the Lower Extremity: Diagnosis, Treatment, and Care,* Cornwall Books: Cranberry: New Jersey. 08512.

INJURY IN RELATION TO DELAYED MENARCHE AND SECONDARY AMENORRHEA

ABRAHAM, S.F., BEAUMONT, P.J.V., FRASER, I.S., LLEWELLYN-JONES, D. (1982) "Body weight, exercise and menstrual status among ballet dancers in training". *British Journal of Obstetrics and Gynaecology*, 89(7), July: 506-510.

CALABRESE, L.H. & KIRKENDALL, D.T. (1983) "Nutritional and medical considerations in dancers". *Clin Sports Med*, 2: 539-548.

CALABRESE, L.H., KIRKENDALL, D.T., FLOYD, M., RAPOPORT, S., WILLIAMS, G.W. (1983) "Menstrual abnormalities, nutritional patterns, and body composition in female classical ballet dancers". *Physician and sportsmedicine*, 11(20, February: 86-90; 95-96; 98.

CHOLST, I.N., STEINBERG, S.F., TROPPER, P.F., FOX, H.E., SEGRE, G.V., BILEZIKIAN, J.P. (1984) "The influence of hypermagnesemia on serum calcium and parathyroid hormone levels in human subjects". *N Engl. J .Med.* 310: 1221-1225.

DUNN, K. (1981) "Menstrual, diet problems found in ballet dancers". *Physician and Sportsmedicine* 9(8), August: 21-22.

EMANS, S.J. (1984) "The athletic adolescent with amenorrhea". *Pediatric Annals* (New York), 13, 8, August: 605; 612.

DRUMMOND, D.S. AND ROGALA, ELJ. (1980) "Growth and maturation of adolescents with idiopathic scoliosis". *Spine*, 5: 507-511.

FRISCH, R.E., & REVELLE, R. (1971) "Height and weight at menarche and a hypothesis of menarche". *Arch Dis Child*, 46:695-701.

GARNER, D.M. & GARFINKEL, P.E. (1980) "Sociocultural factors in the development of anorexia nervosa". *Psychol Med*, 10: 647-656.

"The Eating Attitudes Test: an index of the symptoms of anorexia nervosa". *Psychol Med*, 9: 273-279.

HOLLINGSHEAD, A.B., REDLICH, F.C. (1958) *Social Class and Mental Illness: a Community Study,* John Wiley: New York.

LINDBERG, R.S., FEARS, W.B., HUNT, M.M., POWELL, M.R., BOLL, D., WADE, C.E. (1984) "Exercise-induced amenorrhea and bone density", *Ann Intern Med*, 101:647-648.

LINDSAY, R., HART, D.M., MACLEAN, A., CLARK, A.C., KRASZEWSKI, A., GARWOOD, J. (1978) "Bone response to termination of oestrogen treatment". *Lancet*, 1: 1325-1327.

LOUCKS, A.B. (1986) "Skeletal demineralization in the amenorrheic athlete". Commonwealth and International Conference on Sport, Physical Education,

Dance, Recreation and Health (8th: 1986: Glasgow). In Macleod, D.A.D. (ed.) et al., *Exercise; benefits, limits and adaptations*, London, E. & F.N. Spon, 1987: 255-269.

NORDIN, D.E.C., AARON, J., SPEED, R., CRILLY, R.G. (1981) "Bone formation and resportion as the determinants of trabecular bone volume in postmenopausal osteoporosis". *Lancet*, 2: 277-279.

PRIOR, J.C. (1986) "Exercise-related adaptive changes of the menstrual cycle". C'wealth and International Conference on Sport, Physical Education, Dance, Recreation and Health (8th: 1986: Glasgow). In Macleod, D.A.D. (ed.) et al., *Exercise: benefits, limits and adaptations*, London, E. & F.N. Spon, 1987: 236-254.

SARGENT, D.W. (1963) "Weight-height relationship of young men and women". *Am J Clin Nutr*, 13: 318-325.

SEGRE, G.V., TREGEAR, G.W., POTTS, J.T. JR. (1975) "Amino-terminal radioimmunoassays for human parathyroid hormone". In Frame, B., Totts, J.T. Jr, eds. Clinical disorders of Bone and Mineral Metabolism, *Excerpta Medica*: Amsterdam: 14-17.

SHADE, A.R. (1983) "Gynaecologic and obstetric problems of the female dancer". *Clinics in Sports Medicine* (Philadelphia), 2(3), November: 515-523.

TEITZ, C.C. (1982) "Sports medicine concerns in dance and gymnastics, *Pediatric Clinics of North America* 29(6), December: 1399-1421.

UNDERWOOD, L.E. & VAN WYK, J.J. (1981) "Hormones in normal and aberrant growth". In Williams, R.H. (ed), *Textbook of Endocrinology*, 6th edition, W.B. Saunders: Philadelphia: 11149-1191.

WARREN, M.P. "The effects of exercise on pubertal progressions and reproductive function in girls". *J Clin. Endocrinol .Metab.*, 1980, 51: 1150-1157.

"Effects of undernutrition on reproductive function in the human". *Endocr . Rev,. 1983, 4: 363-377.*

"Menstrual effects of dance training". In Clarkson, P. M. and Skrinnar, M.(eds), *Science of dance training,* Champaign, Ill., Human Kinetics Books, 1988: 209-211.

WARREN, M.P., SIRIS, E.S., PETROVICH, C. (1977) "The influence of severe illness on gonadotropin secretion in the postmenopausal female". *J. Clin. Endocrinol. Metab.* 45: 99-104.

WILLNER, S. (1975) "A study of height, weight and menarche in girls with idiopathic structural scoliosis". *Acta Orthop. Scand.* 46: 71-83.

ANOREXIA AND DANCE

BRAISTED, J.R., MELLIN, L., GONG, E.J., IRWIN, C.E. (1985) "The adolescent ballet dancer: Nutritional practices and characteristics associated with anorexia nervosa". *Journal of Adolescent Health Care,* New York, 6, 5, September: 365-371.

BROOKS-GUNN, J., WARREN, M.P., HAMILTON, L.H. (1987) "The relation of eating problems and amenorrhea in ballet dancers". *Medicine and Science in Sports and Exercise,* (Indianapolis), 19, 1, February: 41-44.

CALABRESE, L.H., KIRKENDALL, D.T., FLOYD, M., RAPOPORT, S., WILLIAMS, G.W. (1983) "Menstrual abnormalities, nutritional patterns, and body composition in female classical ballet dancers". *Physician and Sportsmedicine,* 11(2), February: 86-90; 95-96; 98.

EVERS, C.L. (1987) "Dietary intake and symptoms of anorexia nervosa in female university dancers". *Journal of the American Dietetic Association,* (Chicago), B7, 1, January: 66-68.

GORDON, S. (1985) "The demands of dance training". In Peterson, D.R. (ed.) et al., *The medical aspects of dance: proceedings of a conference*

held May 23-25, at the University of Western Ontario, London, Canada, London, Ont., Sports Dynamics (1986); 5-13.

LUNDHOLM, J.K. & LITTRELL, J.M. (1986) "Desire for thinness among high school cheerleaders: relationship to disordered eating and weight control behaviors". *Adolescence,* (Roslyn Heights, New York), 21, 83, Fall: 573-579.

MALONEY, M.J. (1983) "Anorexia nervosa and bulimia in dancers. Accurate diagnosis and treatment planning". *Clinics in Sports Medicine* (Philadelphia), 2(3), November: 549-555.

MEERMANN, R. (1983) "Experimental investigation of disturbances in body image estimation in anorexia nervosa patients, and ballet and gymnastics pupils". *International Journal of Eating Disorders,* 2(4), Summer: 91-100.

SCHNITT, J.M., SCHNITT, D., DELA'UNE, W.D. (1986) "Anorexia nervosa or thinness in modern dance students: comparison with ballerinas". *Annals of Sports Medicine* (North Hollywood, Calif), 3,1: 9-13.

SZMUKLER, G.I., EISLER, I., GILLIES, C., HAYWARD, M.E. (1985) "The implications of anorexia nervosa in a ballet school". *Journal of Psychiatric Research* (Oxford), 19, 2/3: 177-181.

INJURIES IN DANCERS' FOOT AND ANKLE

AMBRE, T., and NILSSON, B.E. (1978) "Degenerative changes in the first metatarsophalangeal joint of ballet dancers". Acta Orthop. Scand., 49: 317.

ANDERSON, J.M. (1978) *Grant's Atlas of Anatomy.* Williams and Wilkins: Baltimore.

ARNHEIM, D.D. (1980) *Dance Injuries, Their Prevention and Care.* Second Edition, The C.V. Mosby Co: Toronto.

BRODELIUS, A. (1960) "Osteoarthritis of the talar joints in footballers and ballet dancers". *Acta Orthop. Scand*, 30: 309-314.

BRODSKY, A.E. and KHALIL, M.A. (1987) "Talar compression syndrome". *Foot Ankle*, June, 7(6).

BURMAN, M.S. and LAPIDUS, P.W. (1931) "The functional disturbances caused by the inconsistent bone and sesamoids of the foot". *Arch. Surg*, 22: 936.

BURROWS, J.F. (1956) "Fatigue infraction of middle of tibia in ballet dancers". *Journal of Bone Joint Surgery*, 38B: 83.

"Ankle and Foot Problems in the Athlete". March (1982), W.B. Saunders Co: Toronto, Vol. 2.

"Injuries to dancers". (November 1983), W.B. Saunders Co: Toronto, Vol 2, No.3.

CONTOMPASIS, J. (1984) "Common adolescent dance injuries". *Clinics in podiatry* 1, 3, December: 631-644.

DAVAS, M. (1975) *Stress Fractures*. Churchill Livingstone: Edinburgh.

ELLEBY, D.H. and MARCINKO, D.E. (1985) "Digital fractures and dislocations. Diagnosis and treatment". *Clinical Podiatry* 2, 2, April : 233-245.

FOND, D. (1984) "Flexor hallucis longus tendinitis - A case of mistaken identity and posterior impingement syndrome in dancers: evaluation and management". *Journal of Orthopaedic and Sports Physical Therapy*, (Baltimore) 5(4), Jan/Feb: 204-206.

GELABERT, R. (1980) "Preventing dancers' injuries". *Physician and sportsmedicine* 8(4), April: 69-73, 76.

GOULD, J.A. and DAVIES, G.J. (1985) *Orthopaedic & sports physical therapy*. The C.V. Mosby Co: Toronto, Vol.2.

GOULD N., SELIGSON, D., GASSMAN, F. (1980) "Early and late repair of the lateral ligament of the ankle". *Foot Ankle,* 1: 84-89.

GRAHAM, R., SAUNDERS, A.S., MAISEY, N. (1979) "The use of scintigraphy in the diagnosis and management of traumatic foot lesions in ballet dancers". *Rheumatol., Rehabil.*, 18: 235.

HAMILTON, W.G. "Dancer's tendonitis of the flexor hallucis longus". Am. Orthop. Soc. Sports Med Meeting, (July 1976).

"Tendonitis about the ankle joint in classical ballet dancers: Dancer's tendonitis". *American Journal of Sports Medicine,* (1977), 5: 84.

"Sprained ankles in ballet dancers". *Foot Ankle,* (1982), 3(2): 99-102.

"Stenosing tenosynovitis of the flexor hallucis longus tendon and posterior impingement upon the os trigonum in ballet dancers". *Foot Ankle,* (1982), 3(2): 74-80.

"Surgical anatomy of the foot and ankle". *C.I.B.A. Clin. Symp.* (1985), 37(3): 2-32.

"Foot and ankle injuries in dancers", *Clinics in sports medicine* (Philadelphia), (Jan 1988), 7,1: 143-173.

HARDAKER, W.T., MARGELLO, S., GOLDNER, J.L. (1985) "Foot and ankle injuries in theatrical dancers", *Foot Ankle*, Baltimore, Md., October, 6, 2: 59-69.

HARDAKER, W.T., MOORMAN, C.T. (1986) Olympic Scientific Congress (1984, Eugene, Oregon), In, Shell, C.G., (ed.), *The dancer as athlete,* (1986), Human Kinetics Publishers: Champaign, Illinois: 31-41.

HOPPENFELD, S. (1976) "*Physical examination of the spine and extremities*", Appleton-Century-Crofts: New York.

HOWSE, A.J.G. "Disorders of the great toe in dancers". *Clinics in sports medicine* Philadelphia, (November 1983), 2(3): 499-505.

"Posterior block of the ankle joint in dancers". *Foot Ankle,* (1982), 3: 8.

"Orthopaedists aid ballet". Clin. Orthop. Rel. Res., (1972), 89: 52.

HOWSE, J., and HANCOCK, S. (1988) *Dance Technique and Injury Prevention.* A. and C. Black: London - distributed in Australia by Hodder and Stoughton.

INMAN, V. (1976) *The joints of the Ankle.* (1976), Williams & Wilkins: Baltimore.

GRAY, H. (1973) *Gray's Anatomy of the Human Body.* ed. 35, Warwick, R. and Williams, P.L. (eds), Philadelphia: W.B. Saunders: 382, 461.

JONES, R. (1982 "Fractures of the fifth metatarsal bone". *Liverpool Medical Surgical Journal*, 42:103.

KELLY, R. (1985) "Lower leg and ankle problems associated with dance". *Journal of the Canadian Athletic Therapists Association* ,Ottawa, Summer, 12(1),: 5-9.

KENDALL, H.O., KENDALL, F.P., WADSWORTH, G.E. (1971) *Muscles: Testing and function.* Second Edition, (1971), Williams & Wilkins: Baltimore.

KIRKENDALL, D. and CALABRESE, L.G. (1983) "Physiologic aspects of dance". *Clin. Sports Med.*, 2: 525.

KLEIGER, B. (1982) "Anterior tibiotalar impingement syndromes in dancers". *Foot Ankle*, 3(2): 81-84.

KLIMAN, M., GROSS, A., PRITZKER, P., GREYSON, D. (1983) "Osteochondritis of the hallux sesamoid bones". *Foot Ankle,* 3(4): 220-223.

KNOTT, M., and VOSS, D.E. (1968) *Proprioceptive Neuromuscular Facilitation: patterns And Techniques.* Second Edition, Hoeber Medical Divisions, Harper & Row: New York.

LEHMAN, R., TORG, J., PAVLOV, H., DELEE, J. (1987) "Fractures of the base of the fifth metatarsal distal to the tuberosity: A review". *Foot Ankle,* 7(4): 245-252.

LEWIS, O. (1980) "The joints of the evolving foot. Part 1: The ankle joint". *J. Anat,. (1980), 130(3): 527-543.*

MICHELI, L.J., GILLESPIE, W.J., WALAFZED, R.A. (1984) "Physiologic profiles of female professional ballerinas". *Clin. Sports Med.*, 3: 199.

MICHELI, L.J., WALASZED, A., GERBINO, P.G. (1981) "Are ballerinas physically fit?". *Dance Magazine,* Dec: 74.

MILLER, E.H. (1975) "A new consideration in athletic injuries in the classical ballet dancers". *Clin. Orthop.*, 111: 181-192.

MCMINN, R.M.H., and HUTCHINGS, R.T. (1988) *A Colour Atlas Of Human Anatomy.* Second Edition, Wolfe Medical Publications Ltd: Netherlands.

MYERS, M. (1982) "Talking technique: is the grand plie obsolete?". *Dance Magazine,* June

NEWELL, S., WOODIE, A. (1981) "Cuboid syndrome". *Phys. Sports Med.*, 9(4): 71-76.

NICHOLAS, J.A. (1978) "Risk factors, sports medicine and the orthopaedic system: an overview". *Am. J. Sports Med.*, 3: 243.

O'DONOGHUE, D.H. (1970) *Treatment Of Injuries To Athletes.* Second Edition, W.B. Saunders Co.

PARKES, J.G., HAMILTON, W.G., PATTERSON, A.H. RAWLES, J.G.Jr. (1980) "The anterior impingement syndrome of the ankle". *J .Trauma,* 20(10): 895-898.

PRATHER, J.LK., NUSYNAWITZ, M.L., SNOWDY, H.A., HUGHES, A.D., MCCARTNEY, W.H., BAGG, R.J. (1977) "Scintigraphic findings in stress fractures". *J. Bone Joint Surg.*, 59A: 869.

QUIRK, R. "The talar compression syndrome in dancers". Foot Ankle, (1982), 3(2): 65-68.

"Ballet injuries, the Australian experience". *Clin. Sports Med.*, (1983), 2: 507-514.

"Stress fractures of the foot". *Australian Family Physician,* (Aug 1987), 16(8): 1101-2.

ROBINSON, M.A. (1982) "Foot and ankle injuries in dance". American College of Sports Medicine", New England Chapter, Meeting (1981: Concord, Mass.). In *Sports Medicine - Sports Science: bridging The Gap*, (1982), Lexington, Mass: Collamore Press: 143-149.

ROVERE, G.D., WEBB, L.X., GRISTINA, A.G., VOGET, J.N. (1983) "Musculo-skeletal injuries in theatrical dance students". *Am. J. Sports med.*, 11: 195.

ROY, STEVEN, IRVIN, and RICHARD. (1983) *Sports Medicine Prevention, Evaluation, Management And Rehabilitation.* Prentice-Hall Inc: New Jersey.

SALTER, R.B. (1970) *Textbook of Disorders and Injuries of the Muscolo-skeletal System.* The Williams and Wilkins Co: Baltimore.

SAMMARCO, G.J. "Dance injuries". In Nicholas, J.A. and Hershman, E.B. (eds.), *The Lower Extremity and Spine in Sports Medicine*, (1986), C.V. Mosby & Co: St. Louis, Mo: 1406-1439.

"Forefoot conditions in dancers". Parts I and II, *Foot Ankle,* (1982), 3(2): 85-98.

"The foot and ankle in classical ballet and modern dance". In *Disorders of the Foot*, Jahss, M.H. (ed), W.B. Saunders: Philadelphia: 626-659.

SCHNEIDER, H.G. (1974) "Stress injuries and developmental changes of the lower extremities in ballet dancers". *Radiology*, 113: 627-632.

SHANDS, A.R., and WENTZ, I.J. (1953) "Congenital anomalies; accessory bones and osteochondritis in the feet of 850 children". *Surg. Clin. North Am.*, 33: 1643.

SOUTHMAYD, WILLIAM, HOFFMAN, MARSHALL. (1981) *Sports Health, the Complete Book of Athletic Injuries*. Quick Fox: New York.

TEITZ, C.C. (1986) Olympic Scientific Congress (Eugene, Oregon 1984), "First aid, immediate care, and rehabilitation of knee and ankle injuries in dancers and athletes". In Shell, C.G. (ed.), T*he Dancer as Athlete*. Champaign, Illnois, Human Kinetics Publishers, Illinois (1986).

THOMASEN, E. (1982) *Diseases and Injuries of Ballet Dancers*. Universitetsforiaget 1, Arhus, Denmark.

WARREN, M.P., HAMILTON, W.G. (1986) "Scoliosis and fractures in young ballet dancers: relation to delayed menarche and secondary amenorrhea". N *Engl J Med*, 314: 1348-1353.

WILES, PHILIP, SWEETNAM, RODNEY. (1965) *Essentials of Orthopedics*. Fourth Edition, Little, Brown and Co: Boston.

WOLIN, I., GLASSMAN, F., SIDEMAN, S., LEVENTHAL, D. (1950) "Internal derangement of the talofibular component of the ankle". *Surg. Gyneacol. Obstet.*, 91: 193-200.

WRIGHT, S. (1985) *Dancer's Guide to Injuries of the Lower Extremity: Diagnosis, Treatment, and Care*. Cornwall Books: New Jersey.