

## **RESEARCH NEEDS AND OPPORTUNITIES IN MH/MR FACILITIES**

### **Purpose of this Module**

The purpose of this module is to increase the institutional dental staff's awareness regarding the opportunity to conduct clinically meaningful and yet practical research/program evaluation projects. The suggestions regarding potential areas of investigation are a result of the dental literature review presented in Module 14 . Although the information is based upon an MR institution model, similar research/program evaluation efforts can be made in a MH facility.

### **Learning Objectives**

After reviewing the written materials, the participant will be able to:

1. Discuss two reasons why there is so little information in the dental literature relating to the severely disabled person.
2. List and discuss ten possible research/clinical evaluation projects that would be suitable for a MH/MR dental facility.

## RESEARCH NEEDS AND OPPORTUNITIES IN MH/MR FACILITIES

### INTRODUCTION

During recent years there has emerged an increased awareness of the need for clinically applied research activities in the area of dental care for developmentally disabled (D.D.) persons. Dental clinicians continue to face long standing treatment dilemmas without adequate support and guidance from the dental scientific literature. Classic examples concern the proper management of phenytoin induced gingival overgrowth (Dilantin® hyperplasia) and the dramatic course of periodontal disease in many persons with Down Syndrome. The perceptive observer may conclude that the number of annual publications that make a positive contribution to the clinical or programmatic management of these individuals actually has decreased during the past several years.

There are several reasons for this scarcity of scientific inquiry into the dental problems of the DD population. First, there is a decreased emphasis within the dental schools on programs for the persons with disabilities. This is primarily due to decreased federal funding for the University Affiliated Facility (UAF) training programs and the privately funded Robert Wood Johnson programs for undergraduate dental training in treatment of the person with disabilities. A second influence is the emergence of other priority issues which receive more attention, such as geriatric dentistry. Third, many of these treatment dilemmas require long term investigations for appropriate solutions, which are not appealing to graduate students faced with Master or Doctoral program constraints. The long-term nature of these projects may not be appealing to dental school faculty members who must deal with pressures to publish frequently. The fourth factor is that national research organizations such as the National Institute of Dental Research (NIDR) and the American Dental Association (ADA) focus on issues of broader scope with some lack of interest in the disabled population.

The increased need for innovative clinical procedures based upon sound scientific investigation together with the relative lack of effort from the universities and national research organiza-

tions, make a strong case for conducting these investigations in an institutional setting. Research activities, at first thought, may seem a remote possibility or even threatening for dental professionals providing services in a relatively small institution for mentally retarded individuals. There are several factors, however, that serve to allay many of these concerns. First, many MR/MH institutions have established working relationships with universities which can act as a resource and support for research activities. At a recent meeting of the Southern Association of Institutional Dentists (SAID), eleven of nineteen MR institutions represented were involved with manpower development programs with dental or dental hygiene schools. A second factor is that many of the important clinical questions can be answered through retrospective studies, not experimental research. Describing and collating successful treatment and prevention methods makes a valuable contribution to the dental literature. This is particularly helpful in questions of programmatic nature such as dental manpower ratios, in addition to clinical investigations such as those that compare the success rate of one accepted treatment approach versus another. Even experimental research, if avoiding sensitive areas, (such as comparing the effectiveness of automatic versus manual toothbrushes) is often not threatening to the administrative staff or human rights committees. Another factor that can stimulate research efforts in this area is the collaboration of two or more institutions in pooling research resources and enlarging the pool of subjects.

In order to stimulate research activities within institutions for the developmentally disabled, the following section outlines possible areas of investigation with an occasional comment about methodology. This list is, of course, not exhaustive but is provided for the sole purpose of stimulating thought and action that will ultimately contribute to the body of knowledge upon which practitioners rely to provide the highest quality of care. Each issue can be multiplied and amplified many times over.

## POSSIBLE RESEARCH PROJECTS

### # Restorative

1. Discuss and describe restorative problems and options in patients with severe bruxism and/or severe erosion.
2. Describe benefit or detriment of using modified occlusal preps with filled resin vs. sealants alone.

### # Prosthetics

1. Document the incidence of secondary decay at margins of cast restorations in MR patients with chronic poor oral hygiene. Are these restorations really contraindicated?
2. Compare/document/describe reasons for cast restoration failures in MR population (percentages due to: trauma, masticatory problems, secondary decay, other).
3. Describe/compare the success/failure rate of composite crowns vs polycarbonate vs steel crowns in anterior teeth of MR patients.
4. Describe success/failure of the use of stainless steel crowns as a permanent restoration on posterior teeth in MR patients where cast restorations are impractical. Address problems such as gingivitis, wear through, amalgam patches, etc.
5. Describe success/failure of criteria used to screen MR patients as suitable for complete denture service.
6. Describe success/failure rate for Maryland bridges in MR patients. Describe factors contributing to failure. Discuss alternatives.
7. Describe reasons for high failure rate of removable partial dentures in MR population. Discuss alternatives.
8. Explore and describe modifications to full dentures and/or removable partial dentures for MR patients with seizure problems

(plastic teeth, opaque acrylic, nylon mesh, metal mesh, etc.)

9. Describe a quality improvement program that effectively and efficiently addresses the issue of prosthetic replacement of lost teeth in MR patients.
10. Describe reasons for loss of full and partial dentures in MR patients.
11. Describe effectiveness of modified prosthetic devices which have been utilized within your institution (modified FPD designs might include composite facings bonded to cast framework, etc.)

### # Periodontics

1. Investigate value of interdictional surgical procedures in Down Syndrome patients with excellent oral hygiene.
2. Discuss architectural problems in alveolar bone formation of Down Syndrome patients and the effect on periodontal disease.
3. Describe a quality improvement program that effectively and efficiently addresses the issue of periodontal surgery in severe MR patients.
4. Describe incidences of periodontitis in MR patients. Any sex/race/age influences.
5. Investigate the incidence of ANUG in patients with Down Syndrome and other MR individuals. Compare with literature and with general population.
6. Describe the success/failure rate of various perio surgical procedures especially with Dilantin Hyperplasia (gingivectomy vs. flap, etc.)

### # Restraint and Positioning Devices

1. Describe the use of bean bag dental chair insert for positioning CP patients. Discuss alternatives.

2. Evaluate literature on head positioning devices (e.g. on wheelchairs).
3. Evaluate literature on body positioning devices for panoramic radiographs.

### # Sedation

1. Describe problems/successes of use of nitrous sedation with CP, MR, and psychotic patients on psychotropic drugs etc.
2. Demerol supposedly lowers seizure thresholds; nitrous supposedly raises seizure thresholds; compare with nurses notes; any problems?
3. Do patients who exhibit sub-therapeutic blood levels of anticonvulsant drugs at therapeutic doses also exhibit problems with dental sedation?
4. Compare effectiveness of various sedative regimes now being used with MR patients: Droperidol with or without benadryl; Valium with or without phenergan, etc. Descriptive and/or experimental, side effects, routes of administration, monitoring problems, etc.

### # Prevention

1. Compare effectiveness of plaque removal of various toothbrushes in the MR population (Act II, Collis-Curve, Reach, manual, modified manual, automatic etc.). Subdivide for various levels of MR and physical limitations.
2. Identify types of MR patients where oral hygiene instruction is most effective (perhaps those that always must be brushed by others); where least effective. (Ambulatory vs non-ambulatory).
3. Explore and describe use of non-mechanical plaque reducers (chlorhexidine, hexitol, kanamycin, fluoride rinses, etc.).
4. Investigate the severe calculus formation in tube-fed individuals. Effect of oral hygiene, formula, other.

5. Explore and describe home use fluoride for MR persons who cannot expectorate. Compare age groups - permanent vs. primary dentition.
6. Explore fluoride regimens for individuals with severe enamel hypoplasia (vs. rampant caries) and severe erosion.
7. Describe number and percentages of outpatients on fluoride water systems compared with general population in State.
8. Describe the optimal prophylaxis schedule with various patient types.
9. Review and describe Keyes technique implications with MR population.
10. Are intraoral or gingival sulcular organisms in Down Syndrome patients different (more virulent) than other MR or non-MR clients?
11. Describe success/failure with irrigating devices (e.g. water pik) with the MR individuals.

### # Programmatic

1. Describe outcomes/followups of all general anesthesia cases. Percentage who can return for minor treatment with local anesthesia.
2. Describe types of general anesthesia cases: full mouth extractions, surgery only, endodontic only, full restoration, pedodontic vs. adults.
3. Descriptive articles on success/failure aspects of: (a) OR construction for MR/MH/CP patients; (b) Dental clinic construction for MR/MH patients; (c) Dental equipment for MR/MH/CP patients.
4. Describe and compare dental needs and services provided community based MR vs. MH patients.
5. Using dental statistical reports, make all comparisons that are productive (e.g.: services provided inpatients vs. outpatients,

- services provided cooperative vs. non-cooperative patients etc.).
6. Describe and compare dental services available from community public health dental clinics, private dentists and outreach (out-patient) institutional dental programs.
  7. Describe skills and competencies needed by institutional dental staff (dentists, dental hygienists, dental assistants).
  8. Describe a continuing education plan that would insure continually updated skills of institutional dental staff.
  9. Describe and evaluate components of training programs for dental students, dental hygiene students, dental assistant students, practicing dental professionals.
  10. Describe parental attitudes and concerns toward dental services for their DD child (inpatients vs. outpatients).

#### # Other

1. What percentage of MR/MH individuals are mouth breathers? Compare with general population controlled for age. Effect on nitrous use? Effect on dry mouth/wet mouth?
2. Are aphthous ulcers more or less common with this population?
3. Is lip biting after use of local anesthetic more or less common compared with the general population? Tongue biting?
4. Design a card index/computer program so that all patients (inpatients and outpatients) can be grouped by categories (e.g. diagnosis) for research purposes.
5. Describe an effective and efficient quality improvement program that addresses the reasons why orthodontic services are not provided to many MR individuals.
6. Explore and describe modified orthodontic procedures for MR/MH persons for whom full orthodontics is not a realistic expectation due to behavior problems.
7. Compare enamel solubility of extracted teeth from patients with Down Syndrome vs other MR/MH/CP patients controlled for age.
8. Describe the availability of general anesthesia services for MR/MH patients in community hospitals. Describe problems. Discuss staff privileges, protocol, etc.
9. Describe excess saliva and drooling problem with many MR/MH and CP patients. Do drugs such as Atropine, Scopolamine help? Any problems?
10. Explore with physical therapy departments the construction of a functional and effective but lighter/cleaner/more attractive head, face and mouth protector for seizure patients.
11. Investigate various aspects of trauma and falls of seizure patients and describe risk factors to dentition.
12. Discuss and describe rumination in severe MR patients. Pulp damage, role of fluorides, anti-acids, diet, problems with dental restorations, decay, perio.
13. Describe bruxism in MR/MH patients, restorative problems, TMJ problems, perio problems, decay, etc.
14. Discuss role and limitations of hard and soft mouth guard devices in patients with MR, CP, Down Syndrome, Lesch-Nyhan Syndrome and self-abuse.
15. Compare dental cooperation of patients with Down Syndrome by age groups (older vs. younger).
16. Describe percentages of convulsive disorders of patients with Down Syndrome vs. other MR, CP, MH general population.

17. Describe various modifications of radiographic techniques with MR and CP patients (patient/practitioner protection, monitoring etc.).
18. Describe use and limitations of traditional behavior modification programs for dental behavior with or without use of sedation.
19. Describe or evaluate actual vs. potential bleeding problems after dental surgery of patients taking Depakane or Tegretol.
20. Evaluate and describe TMJ problems in patients with CP, MR, MH, Down Syndrome.
21. Review literature and describe latest cumulative findings on patients with CP, Down Syndrome, other syndromes, blindness, deafness.

## SUMMARY

There are certain actions that may enhance the involvement of dental staff in MR/MH institutions with dental scientific investigations. First is a commitment on the part of the dental staff and/or dental program director to develop, through evaluative efforts, better ways of providing services to MR/MH patients. Second is the support of institution and Division administrative staff needed to encourage these efforts. This support may consist of providing continued educational opportunities for the dental staff, providing consultant input and providing data analysis which is traditionally a major barrier to research efforts in a clinical setting. Another barrier to clinical investigation is the perceived antagonistic attitude of parents and human rights committees. Since most investigations are retrospective rather than experimental in nature, the careful explanation to these groups by the investigator of the nature and benefits of the planned research activities should alleviate most problems. Although institutional programs are encouraged to engage in research activities to address the unique needs of their patients, not every institution is an appropriate setting for this activity.

\* \* \* \* \*