

Research Literature Review on Mid-level Oral Health Practitioners

Mid-level practitioners have been well studied and researched in many other countries that have long-standing mid-level practitioner programs and in the United States in pilot programs conducted in the 70's and more recent research in Alaska. Research studies have consistently shown that mid-level oral health practitioners improve access, reduce costs, provide excellent quality of care, and do not put patients at risk. The following is a review of the major research studies on mid-level oral health practitioners.

Evaluations of clinical competency

P.E. Hammons, H.C. Jamison, L.L. Wilson. "Quality of service provided by dental therapists in an experimental program at the University of Alabama." *Journal of the American Dental Association*. 1971; 82:1060-1066

- A comparison study between dentists in private practice and dental therapists at the University of Alabama School of Dentistry found that the quality of service was equally competent for six clinical procedures, including inserting amalgam restorations, inserting silicate cement restorations, finishing amalgam fillings, finishing silicate fillings, inserting temporary fillings, and placing matrix bands for amalgam fillings. More specifically, for the both of the unfinished and finished restoration procedures, none of the differences in proportions of excellent ratings was statistically significant. In certain cases, the minor differences tended to favor the dental therapists for seven of the 12 aspects evaluated for unfinished restoration procedures. When evaluating temporary procedures that include fillings, the differences in ratings of excellence between the dentists and dental therapists were statistically significant, favoring the therapists.

L.J. Brearley, FN Rosenblum. "Two-year evaluation of auxiliaries trained in expanded duties." *Journal of the American Dental Association*. 1972; 84:600-610.

- A two-year evaluation of the performance of expanded duty dental assistants compared to those of senior dental students indicated that the expanded duty dental assistants' quality of procedures performed was consistently as good as the performance shown by the senior dental students. Furthermore, in certain procedures, the expanded duty dental assistants tended to be significantly superior to dental students in the performance of prophylaxes, matrix removal, and placement of Class I amalgam restorations.

J. Abramowitz, L.E. Berg. "A four-year study of the utilization of dental assistants with expanded functions." *Journal of the American Dental Association*. 1973; 87:623-635.

- A four-year study of the effectiveness of expanded duty dental assistants (dental auxiliaries) found that the participating dental auxiliaries were able to provide delegated procedures of acceptable quality, including Class II amalgam and Class III silicate restorations and no significant differences were found for the "acceptable" rating between dentists and auxiliaries for both procedures.

E.R. Abrose, A.B. Hord, W.J. Simpson. *A Quality Evaluation of Specific Dental Services Provided by the Saskatchewan Dental Plan*. (Regina, Canada: Province of Saskatchewan Department of Health, 1976).

- A treatment quality evaluation of the Saskatchewan Dental Plan, which includes a dental nurse training program modeled after the New Zealand program, focused on the procedures of amalgam restorations, stainless steel crowns, and diagnostic radiographs. Comparing the quality of amalgam restorations performed by dentists to those of dental nurses, just over 20 percent of restorations performed by dentists tended towards a rating of unsatisfactory and 15 percent towards a rating of superior whereas dental nurses were rated at just 3 to 6 percent unsatisfactory and 45 to 50 percent approaching superior standards. In regards to stainless steel crowns, the dentists and dental nurses appeared to function at the same standard of quality

Ralph Lobene and Alix Kerr. *The Forsyth Experiment: An Alternative System for Dental Care* (Cambridge, MA: Harvard University Press, 1979).

- Based on blind evaluations, the advanced skills hygienists were found to perform restorative dentistry equal in quality to that done by practicing dentists. For example, the group mean score for all cavity preparations was 10.2 quality points for the hygienists versus 10.0 quality points for the dentists. Comparing multisurface cavity preparations, those completed by the hygienists had a higher mean quality score that was statistically significant at the 5 percent confidence level. The hygienists also achieved a slightly superior group mean score for single-surface restorations with 10.7 quality points versus 10.5 quality points for the dentist-performed fillings (p. 82).

Stanley Lotzkar, Donald W. Johnson, Mary B. Thompson. "Experimental program in expanded functions for dental assistants: Phase 3 experiment with dental teams." *Journal of the American Dental Association*. 1971; 82:1067-1081.

- In phase three of a three-phase study on the feasibility of delegating additional duties to chairside dental auxiliaries, dentists, who worked as heads of dental teams with varying numbers of assistants, delegated about two fifths of their work to these auxiliaries. The overall rating of the work performed by the assistants during this phase found that 82% of the procedures were assessed as meeting the required quality standards, compared to 81% of the dentists' work that was assessed as acceptable.

Gordon Trueblood. *A Quality Evaluation of Specific Dental Services Provided by Canadian Dental Therapists* (Ottawa, Ontario, Canada: Epidemiology and Community Health Specialties, Health and Welfare Canada, 1992).

- A study to observe the quality of care provided by dental therapists compared with the level and quality of care provided by dental practitioners statistically concluded that on the basis of six clinical restorative procedures, the quality of restorations placed by the dental therapists was equal and more often better than that of those placed by dentists.
- In addition, the data show a steadily increasing trend that is the result of a steady decrease in the number of required extractions over time relative to restorations, which suggests that dental therapists are being successful in treating dental emergencies and in reducing them through regular on-going care. The steadily increasing trend is the first important line of evidence of the overall effectiveness of the dental therapists in improving dental health in the communities in which they work.

David A. Nash, Jay W. Friedman, Thomas B. Kardos, Rosemary L. Kardos, Eli Schwarz, Julie Satur, Darren G. Berg, Jaafar Nasruddin, Elifuraha G. Davenport, Ron Nagel. "Dental therapists: a global perspective." *International Dental Journal*. 2008; 58:61-70.

- Since their introduction in New Zealand, dental nurses/therapists have improved access to oral health care in increasing numbers of countries. Multiple studies have documented that dental therapists provide quality care comparable to that of a dentist, within the confines of their scope of practice. Acceptance and satisfaction with the care provided by dental therapists is evidenced by widespread public participation. Through providing basic, primary care, a dental therapist permits the dentist to devote more time to complex therapy that only a dentist is trained and qualified to provide.

Kenneth A. Bolin. *Quality Assessment of Dental Treatment Provided by Dental Health Aide Therapists in Alaska*. Paper presented at the National Oral Health Conference; 2007 May 1.

- Charts of patients treated by Dental Health Aide Therapists (DHATs) and dentists in three Alaskan health corporations were audited to assess quality of care and the incidence of adverse events

during or following treatment. Reviews of dental operative and surgical procedures performed by dentists, DHATs under direct supervision, and DHATs working with general supervision were conducted in July and August 2006. Out of 640 comparable operative and surgical dental procedures, 171 were performed by dentists, 218 by DHATs under direct supervision, and 251 by DHATs under general supervision. In charts audited from 5 dental clinics in 3 different Alaskan health corporations employing DHATs, dental treatment was found to be within the scope of training, was delivered in a safe manner, and met the standard of care of the dental profession. For comparable operative and surgical dental procedures, there was no statistical difference in the amount of complications resulting from treatment delivered by dentists vs. DHATs.

Assessments of how well they care for particular populations

David A. Nash and Ron J. Nagel, "Confronting oral health disparities among American Indian/Alaska Native children: The pediatric oral health therapist." *American Journal of Public Health*. 2005; 95, no.8: 1325-1329.

- The use of dental therapists in Canada on First Nation reserves has indicated that the ratio of extractions to restorations has dropped significantly, from over 50 extractions per 100 restorations in 1974 to fewer than 10 extractions per 100 restorations in 1986.

David A. Nash, Jay W. Friedman, Thomas B. Kardos, Rosemary L. Kardos, Eli Schwarz, Julie Satur, Darren G. Berg, Jaafar Nasruddin, Elifuraha G. Davenport, Ron Nagel. "Dental therapists: a global perspective." *International Dental Journal*. 2008; 58:61-70.

- New Zealand's School Dental Service, which is staffed by school dental therapists under the general (indirect) supervision of district public health dentists, currently have over 97% of children under the age of 13 and 56% of preschoolers participating, with virtual elimination of permanent tooth loss.
- In Malaysia, practicing dental nurses now number around 2,090 and have operated in schools since 1985. The program has been very successful, with 96% of elementary and 67% of secondary school children participating and resulting in a sharp decline of decayed teeth and a corresponding increase in restored teeth.

Christine E. Miller, "Access to care for people with special needs: Role of alternative providers and practice settings." *Journal of the California Dental Association*. 2005; 33, no.9:715-721.

- Dental hygienists, with focus on community health and preventive care, are suggested as being the oral health professionals most prepared to address issues of access.

Elizabeth Mertz, Gena Anderson, Kevin Grumbach, Edward O'Neil, "Evaluation Strategies to Recruit Oral Health Care Providers to Underserved Areas of California." (San Francisco, CA: Center for California Health Workforce Studies, 2004).

- The Registered Dental Hygienist in Alternative Practice category was first created in the 1980s as a California Health Manpower Pilot Project to allow hygienists to practice in alternative settings. Each cohort of 17 RDHAP graduates from the West Los Angeles program is estimated to add 34,000 patient visits per year for the underserved.

Attitude of dentists

Brearley LJ, Rosenblum FN. Two-year evaluation of auxiliaries trained in expanded duties. *Journal of the American Dental Association*. 1972; 84:600-610.

- Dental students (91.3%) were favorably oriented towards expanding duties of dental assistants to help alleviate the dental manpower shortage. Most of the dental students favored the delegation of certain procedures to suitably trained assistants, including manipulation of rubber dam, matrixes,

and wedges. There was also a significant attitudinal change by the end of the study to being in favor of the condensation of amalgam and adaptation and cementation of stainless steel crowns by suitably trained assistants.

Louis Fiset. *A Report on Quality Assessment of Primary Care Provided by Dental Therapists to Alaska Natives* (Seattle, WA: University of Washington School of Dentistry, 2005).

- The author completed a four-day site visit to the Yukon-Kuskokwim Corporation dental clinic in Bethel, Alaska and to two remote village dental clinics in Buckland and Shungnak, which are administered by the Maniilaq Corporation dental clinic in Kotzebue. At the Bethel site, he found that each dentist he spoke with was eager to discuss the dental therapists, all positive in their comments. One dentist admitted that the dental therapists' clinical training in pediatric dentistry surpassed her own. Among the dentists practicing at the facility, all expressed no reservation about the dental therapists being sent to sub-regional clinics to provide primary care in the absence of direct supervision by their preceptors.
- Each dental therapist was equipped not only to provide essential preventive services but simple treatments involving irreversible dental procedures such as fillings and extractions. Their patient management skills surpassed the standard of care. They knew the limits of their scope of practice and at no time demonstrated any willingness to exceed them.

Cost-effectiveness and productivity

Abramowitz J, Berg LE. A four-year study of the utilization of dental assistants with expanded functions. *Journal of the American Dental Association*. 1973; 87:623-635.

- A four-year study to determine the feasibility of dental practices using expanded function dental assistants in relation to quality and economic considerations demonstrated that the efficient utilization of these types of auxiliaries resulted in decreased fees, increased net income for the dentists, or a combination of both. More specifically, as more auxiliaries were added to the dental team, the relative costs per unit of time worked decreased from \$2.54 to \$2.26 and the net income for the dentist increased over \$10,000, from \$28,030 to \$39,147.

Ralph Lobene and Alix Kerr, *The Forsyth Experiment: An Alternative System for Dental Care* (Cambridge, MA: Harvard University Press, 1979).

- Results from the Forsyth Experiment indicated that a solo practice dentist using hygienist-assistant teams to provide restorative care could charge lower fees and increase his net income. All patients in the study actually received free treatment, so therefore the income that could have been generated was calculated using the dollar charges for specific dental procedures listed in the 1974 Massachusetts welfare fee schedule and the 1972 schedule of usual fees for New England dentists.

Stanley Lotzkar, Donald W. Johnson, Mary B. Thompson, "Experimental program in expanded functions for dental assistants: Phase 3 experiment with dental teams." *Journal of the American Dental Association*. 1971; 82:1067-1081.

- With dentists heading dental teams with four assistants performing expanded functions, dentists were able to increase their productivity over their base-line performance by 110% to 133%.