



Dental SEPTEMBER 1992 Research News

Research Development Office, (902) 494-1675

Stimulus & Challenge

The voice of Dal Dental research

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Brown Bag LUNCH TIME Discussion Sessions

A series of Brown Bag sessions will be held from time to time. The dates and location of these sessions will be posted on the Faculty Research Development Notice Board.

Topics:

"Clinical Research: The Interface Between Basic Concepts and Clinical Application"

"Human Ethics in Research"

"Animal Protocols for Research"

"The Private Sector and University Research"

"Research, the Driving Force for the Curriculum"

"A Ten Year Plan for Faculty Research"

Further suggestions for additional topics will be welcomed.

Research Symposium

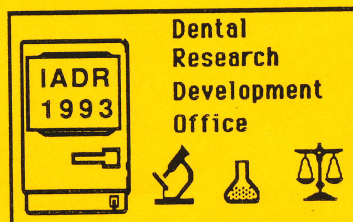
A research symposium was held on 21st August. Students and faculty provided short reviews followed by discussion of the summer research project on which they have been working. The session was a great success and it is planned to hold a similar symposium in August 1993.

Deadline for IADR

Abstracts
for 1993

Chicago meeting

25th September
1992



Stimulation of Research

Do you find that you have difficulty in coming up with ideas for a research project? The commencement of a new term is a good time to evaluate our plans for scholarly activity for the next 5 years. The implementation of the new curriculum might on the one hand seem to limit the time and opportunity for research activity. However, it will undoubtedly provide us all with stimulation and ideas for research projects. We will all need to be more efficient and effective with our time which we devote to scholarly activities. One of the first steps in any research programme should be to conduct a thorough search of the relevant literature. This has the advantage that it avoids unwarranted duplication of research effort and avoids wasting valuable research time. A search of the literature can stimulate new ideas for research projects or innovations in experimental methods and techniques. A survey of broad areas of research can identify trends and patterns or reveal gaps in the state of our knowledge. Indeed what your literature search does not find may well be more important than what it reveals. A literature search can also be used to determine the current research activity of a specific investigator or research group. Access to the Medline data base

through the Apple Share-network is a very simple way in which to commence your research project. The data base currently available goes back to 1986. The searched material can be down loaded into your own personal reference database (in Endnote Plus for example). EndNote Plus is a database manager which allows you to search your own bibliographic references in your own private reference library. However, the major advantage of the system is that it is a bibliography maker, it builds a list of cited references automatically. The references are correctly formatted in the style of your choice. EndNote will correctly place the reference citations in your text and automatically produce a bibliography at the end of your paper. The availability of the MedLine system combined with the use of the EndNote or other database system provides incredible speed and efficiency for your research activities. This is one of the greatest aids and incentives to research and scholarly activity which has become available to our faculty in the past five years. The commencement of our new curriculum means that we will all be faced each day with numerous questions which could form the basis of a research project. Why not commence your MedLine search today.

Five Research Steps

1. Identification of the problem to be investigated;
2. Collection of essential facts pertaining to the problem;
3. Selection of one or more tentative solutions of the problem;
4. Evaluation of these alternative solutions to determine which of them is in accord with all the facts, and;
5. The final selection of the most likely solution.

Tyrus Hillway

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200th Paper

Elliott Sutow was presented with a certificate commemorating the presentation of the 200th Dalhousie paper at IADR/AADR meetings. The certificate presentation took place at the Dental Summer Research Symposium held on 21st August. The title of the 200th paper (abstract # 1391) given by Elliott was "Corrosion of Dental Amalgam: influence of Finishing Technique." by E. J. Sutow, D. W. Jones, A. S. Rizkalla, and P. Johnson. The paper was given at 4:45 pm on Friday, July 3rd 1992, in the Scottish Exhibition and Conference Center.

"RESEARCH NEWS ITEMS"

Do you have any research news which you would like to share with your colleagues? If so, please forward such items to the Research Development Office on a (Macintosh) disc in Microsoft Word, or simply call 1675.

Biocompatibility Testing

The quantitative and qualitative data obtained by our biomaterials group on plasticizer leachability from prosthodontic soft polymer systems has enabled biocompatibility testing to be conducted for specific esters used as plasticizers in current commercial materials. Any new, untried plasticizers can now be evaluated and compared with existing materials. Two different batch numbers of one commercial soft polymer plasticizer liquid bearing the same label [the implication being that it was the same material] were analyzed in our laboratory. One material contained 90% dibutyl phthalate and the other contained 13% dibutyl phthalate with 72% butyl phthalyl butyl glycolate. Our cytotoxicity tests show that these different compositions have different biological effects.

MSc. Success for Kevin

Kevin Farrell successfully defended his thesis for a Master of Science Degree on 25th August 1992. Kevin conducted his research in Biomaterials in collaboration with the Department of Physics. The title of Kevin's thesis was "A Theoretical and Experimental Study of Glass-Ionomer Cements." The Dental research News congratulates Kevin on his success. Kevin is the 5th graduate student to obtain a degree based upon thesis work in Biomaterials at Dalhousie University.

Not So Soft Research

During the past 13 years an in-depth study has been made of the soft plasticized resin materials used as adjuncts in contemporary prosthodontic treatment of traumatized oral mucosa and atrophic residual alveolar bone. This is an excellent example of collaborative research. Our interdisciplinary research consists of a team of experts from a various fields who have been working together on this research project. Our work can also be said to be multidisciplinary since it also involves individual contributions from experts in separate disciplines. It has been stated that "Almost every scientist recognizes that interdisciplinary research can produce major advances." (Watt, F., New Scientist, 130: 1763, 1991)

The loss of soft and hard tissues following surgical treatment of head and neck cancers and trauma to the face (e.g. traffic accident victims) have produced an increased need for the development of improved soft polymer materials for maxillofacial prostheses. Soft polymer prosthodontic materials suffer loss of effectiveness due to degradation as a result of migration (loss) of plasticizing constituents. Our *in vitro* qualitative and quantitative analyses of the plasticizer constituents

leached from a range of commercial denture soft-lining materials has thrown new light on interpretation of the level of clinical effectiveness for these materials. Our biomaterials group, has undertaken computer modeling of plasticizer diffusion through mucosal tissue. The thrust of our work has been directed toward the synthesis of polymer-gel systems with lower levels of external plasticization. We have shown that we can reduce the amount of plasticizer used, while still maintaining an equivalent degree of softness. We have produced soft copolymers by solution polymerization, utilizing a unique and innovative photopolymerization method. Leachability of plasticizers, oligomers and/or monomers from these synthesized polymers is being evaluated using our established *in vitro* method. We are addressing the important aspects of leachability of phthalate esters with regards to toxicity and their biological implications. New polymers which we have produced are undergoing biocompatibility testing as part of their development.

Usable Science

"Clinical research, which involves human subjects, is essential for translating basic knowledge into usable modalities for health care."

Norman Mohl.

Opportunity for Research

Many faculty members may feel that the implementation of the new curriculum might limit the time and opportunity for research activity. However, what is very clear is that it will undoubtedly provide us all with considerable stimulation and ideas for research projects. With the right approach to this stimulation and a more effective and efficient use of our time, we can perhaps undertake even more research and scholarly activity than previously. Some years ago Derek Jones undertook a small research project which was stimulated by a question relating to a joint Biomaterials/Prosthodontics laboratory class. The first year dental class were involved with the making of two alginate impressions for each of 24 students. The manufacturers recommended procedure for mixing was to measure the alginate powder in a volume scoop. Derek had wondered for some time about the consistency and variability of volume dispensing of powder for the mixing of the alginate material. Variations in the powder/liquid ratio would inevitably affect the rate of setting and the physical properties of viscosity, tear strength and elasticity. Reduced elasticity would produce a less noticeable but serious problem due to the inability of the material to fail to fully recover (elastically) from deformation

following removal from any undercuts. The simple experiment which was set up involved arranging for the 24 students to weigh the volume (n=48) of alginate powder that they had measured. A further aspect of the experiment involved three experienced prosthodontic faculty members making 3 measurements each (n=9) and seven dental assistant making 10 measurements each (n=70). The interesting results for the mean weight (g) of alginate powder obtained were as follows: Students, $18.3 \pm 20.8\%$, Faculty, $14.7 \pm 2.9\%$, Assistants, $17.8 \pm 4.9\%$. The actual values ranged from as high as 23.5 down to 14.2 g. This simple experiment based upon a laboratory class exercise illustrates well the fact that research can be conducted with minimum time and money and can also enhance the teaching programme. The students were given feedback on the results obtained. It was possible to identify and relate problems encountered during handling the material relative to the true powder/liquid ratio which had been used. While the lack of sufficient data limits the scientific validity of this experiment it can certainly serve as a pilot study for a more extensive experiment. Our new curriculum is going to provide a significant opportunity to conduct research to satisfy those questions relating to clinical problems.