



# DEVELOPMENT OF AN INDEX FOR PREVENTIVE AND INTERCEPTIVE ORTHODONTIC NEEDS (IPION)

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**BChD, Dip Odont (Pret)**

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PREVENTIVE AND INTERCEPTIVE  
ORTHODONTIC NEEDS (IPION)**

by

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Submitted in partial fulfillment of the  
requirements for the degree of

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**Pretoria**  
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***'The known is finite, the unknown infinite;  
intellectually we stand on an islet in the midst of an  
illimitable ocean of inexplicability. Our business in  
every generation is to reclaim a little more land'***

***- T.H. Huxley***



## **DEDICATION**

***This dissertation is dedicated to my parents who, through many sacrifices, afforded me the opportunity to turn my dreams and aspirations into reality. Their example of integrity and faith in God laid the firm foundation on which I could build my life with confidence.***

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## DECLARATION

I, Cobus Emelius Coetzee, declare that the dissertation I am herewith submitting for the degree MChD (Orthodontics) at the University of Pretoria, is my own work and has not previously been submitted for any other degree at any other university.

A handwritten signature in black ink, appearing to read 'C.E. Coetzee', written over a horizontal line.

C.E. Coetzee

18 November 1999

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## SUMMARY

### DEVELOPMENT OF AN INDEX FOR PREVENTIVE AND INTERCEPTIVE ORTHODONTIC NEEDS (IPION)

by

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Preventive and interceptive orthodontic measures may have the advantage of simplicity and economy, but they must be applied at critical stages of development. Malocclusions where early diagnosis and simple preventive and/or interceptive orthodontic treatment may minimise or eliminate the need for later complex appliance therapy have been identified. This has led to the suggestion that screening of the child population for developing malocclusions and applying preventive and/or interceptive orthodontic measures where appropriate, is of the utmost importance.

Over the years a great number of orthodontic indices have been developed but none of these were, however, specifically designed to determine the need for preventive and interceptive orthodontic treatment. The current policy of the South African government, as well as other health care authorities world wide, is to concentrate on Primary Health Care. This, together with the fact that there is an increasing demand for basic dental services, urge us to place more emphasis on preventive and interceptive orthodontics as part of the Primary Health Care Approach.

It was therefore decided to develop an orthodontic epidemiological index that would determine the need for preventive and/or interceptive orthodontic treatment in six- and nine-year-old children. The result was two separate indices, the Index for Preventive and Interceptive Orthodontic Needs 6 (IPION-6) and the Index for Preventive and Interceptive Orthodontic Needs 9 (IPION-9). A disposable plastic ruler was designed on which all the information needed to use the index is summarised. The ruler is also used to perform certain measurements on study models and patients.

Specific characteristics applicable to preventive and interceptive orthodontics at these two age levels were identified and weighting factors were assigned to each variable. The reliability (reproducibility) and validity of the application of this new index were determined and cut-off points for treatment need were established.

The results showed that the Index for Preventive and Interceptive Orthodontic Needs (IPION) is easy to use and a high level of intra- and inter-examiner agreement was achieved. Cut-off points for different treatment need categories were identified and the validation of the index showed that the index measures what it purports to measure.

The Index for Preventive and Interceptive Orthodontic Needs (IPION) can play an important role in determining the need for early orthodontic intervention in six- and nine-year-old children and will also assist Public Health authorities in planning the distribution of funds available for primary dental care.

## OPSOMMING

### ONTWIKKELING VAN 'N INDEKS VIR VOORKOMENDE EN ONDERSKEPPENDE ORTODONTIESE BEHOEFTE (IPION)

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Voorkomende en onderskeppende ortodonsie beskik oor die voordeel dat dit beide eenvoudig en ekonomies is, maar moet tydens spesifieke stadiums van ontwikkeling toegepas word. Sekere wansluitings waar eenvoudige voorkomende en/of onderskeppende ortodonsie behandeling die behoefte aan latere meer omvattende toesteltherapie kan verminder, of selfs uitskakel, is geïdentifiseer. Dit het daartoe gelei dat voorstelle gemaak is dat gereelde siftingsondersoeke van kinders met ontwikkelende wansluitings uiters belangrik is, ten einde voorkomende en/of onderskeppende ortodonsie behandeling toe te pas, waar nodig.

In die verlede is 'n groot aantal ortodontiese indekse ontwikkel, maar geen een van hulle was spesifiek ontwerp om die behoefte aan voorkomende en onderskeppende ortodontiese behandeling te bepaal nie. Die huidige beleid van die Suid Afrikaanse regering, asook ander gesondheidsowerhede wêreldwyd, lê groot klem op Primêre Gesondheidsorg. Dit, tesame met die feit dat daar 'n toenemende vraag na basiese tandheelkundige dienste is, noop ons om meer klem te lê op voorkomende en onderskeppende ortodonsie as deel van die Primêre Gesondheidsorgbenadering.

Daar is gevolglik besluit om 'n ortodontiese epidemiologiese indeks te ontwikkel wat die behoefte na voorkomende en/of onderskeppende ortodonsie behandeling in ses- en nege-jarige kinders kan bepaal. Die resultaat was twee aparte indekse, die Indeks vir Voorkomende en Onderskeppende Ortodonsie Behoeftes 6 (IPION-6) en die Indeks vir Voorkomende en Onderskeppende Ortodonsie Behoeftes 9 (IPION-9). 'n Wegdoenbare plastiese lineaalstip, waarop al die nodige inligting wat benodig word om die indeks uit te voer, opgesom is, is ontwerp. Die lineaalstip word ook gebruik om sekere metings op studiemodelle en pasiënte te doen. Spesifieke kenmerke toepaslik tot voorkomende en onderskeppende ortodonsie in hierdie twee ouderdomsgroepe is geïdentifiseer en gewigte is aan al die veranderlikes gegee. Daarna is die betroubaarheid (herhaalbaarheid) en geldigheid van die toepassing van hierdie nuwe indeks getoets en afsnypte vir die behoefte aan behandeling is bepaal.

Die resultate toon dat die Indeks vir Voorkomende en Onderskeppende Ortodonsie Behoeftes (IPION) maklik is om te gebruik en 'n hoë vlak van intra- en inter-ondersoeker ooreenstemming is behaal. Sekere afsnypte vir die verskillende kategorieë van behandelingsbehoefte is geïdentifiseer en die geldigheidstudie het bewys dat die indeks wel dit meet waarvoor dit bedoel is. Die Indeks vir Voorkomende en Onderskeppende Ortodontiese Behoeftes (IPION) kan 'n belangrike rol speel om die behoefte aan vroeë ortodontiese intervensie in ses- en nege-jarige kinders te bepaal. Dit sal ook Gesondheidsowerhede in die openbare sektor help in hulle beplanning vir die aanwending van beskikbare fondse vir primêre mondgesondheidsorg.

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