Practice of Health Sciences

-Oral Health and Child Health-

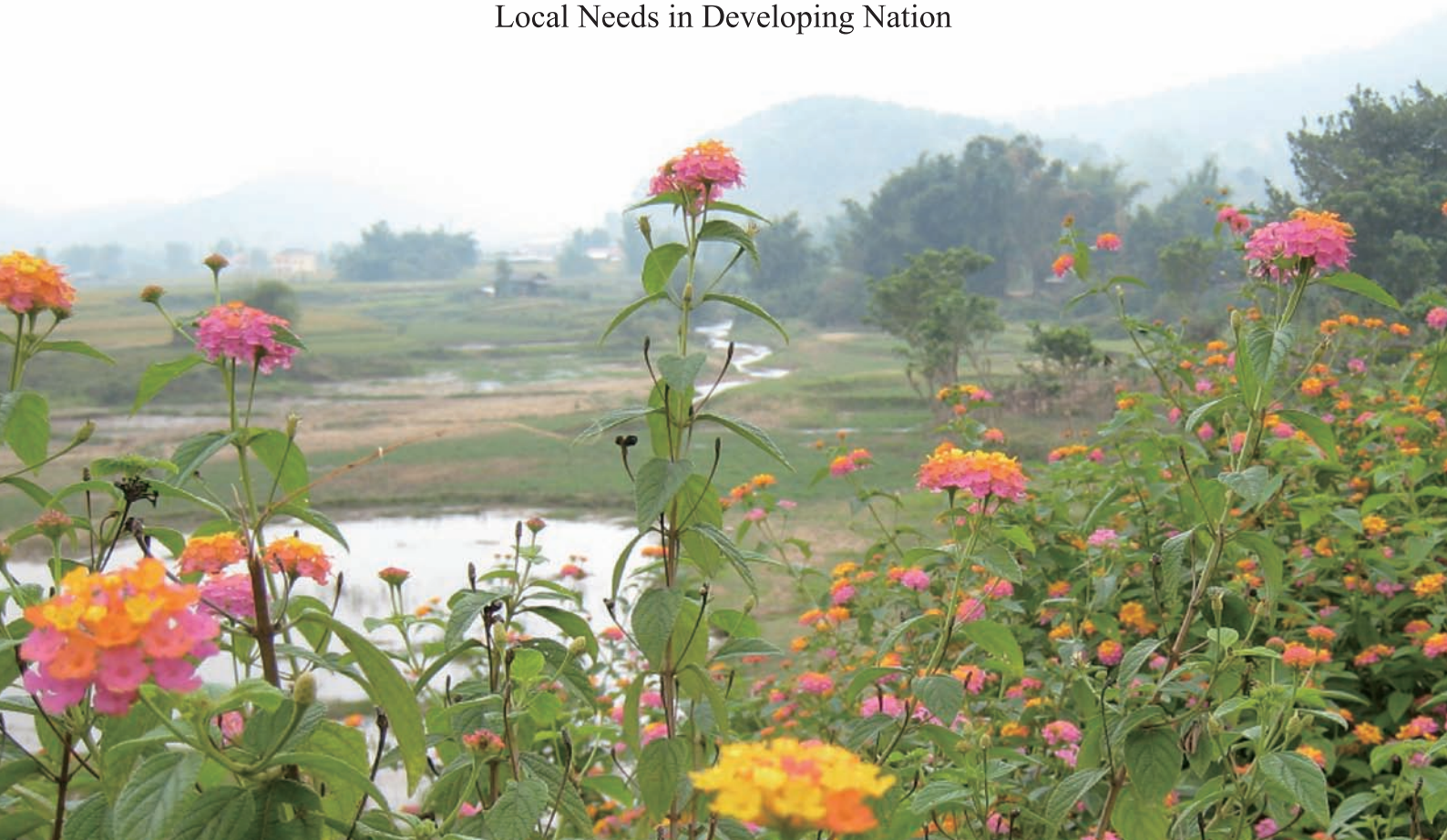
文部科学省
MEXT
MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

The International Educational Cooperation Initiative, MEXT

on

Educational Support for Building Oral Health System by Meeting

Local Needs in Developing Nation



Practice of Health Sciences

-Oral Health and Child Health-

FIRST EDITION

Faculty of Dentistry, University of Health Sciences,
Ministry of Health, Lao PDR

Nihon University School of Dentistry,
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For information, please contact:

Nihon University School of Dentistry
The Education Affairs Department
1-8-13 Kanda-Surugadai,Chiyoda-ku,
Tokyo, 101-8310, Japan
+81-3-3219-8002

- *Upon Publication of Practice of Health Sciences* -

Kichibee Otsuka, DDS, PhD.
Dean, Nihon University School of Dentistry

Nihon University School of Dentistry has started partial supports and cooperation activities for the dental treatment and dental education of the field work which NPO (Non-Profit Organization) was requested by Tokyo Metropolis. Dr. Miyata, a visiting professor of Nihon University School of Dentistry, presides at this NPO called, Organization of International Support for Dental Education. In response to the request of the cooperation activities in Cambodia and Laos, there was an opportunity to visit Laos. This was the beginning of the field activities in Laos for us.

Reformation in university education of Japan has started around 1999, especially, medical and dental education was dramatically changed. As a result, improvement of quality in education and globalization became strongly desired.

With the experience of such reformation in education, volunteers within our school were gathered to support the health promotion project in Laos. Since two years ago, associate professors Nakajima and Motohashi became core team members and applied for MEXT (Ministry of Education, Culture, Sports, Science and Technology) program called "International Cooperation Initiative." Health Promotion program was started upon receiving an approval of the project by MEXT.

First, to demonstrate the situation of Japanese dentistry education, several professors from University of Health Sciences, Laos were invited to Japan. They observed the current activities in Japanese education program, and experienced workshop for the educational program. Also, workshop for infectious disease of the world was held to have further understanding to advance health promotion in Laos. Professors Hayakawa and Mugishima from Nihon University School of Medicine also supported this workshop.

After several reciprocal visits, University of Health Sciences would intend to establish the postgraduate school. Having Professor Ito as a leader, course for influential study was proposed by using current study of Japan.

School of Dentistry also examined various programs to support human resources as much as possible.

As a part of the program, Epidemiological study textbook "Practice of Health Sciences" was produced by their own hands; which was the most effective study method. The purpose of this particular project was to have the basic understanding of epidemiological and growth study of children, and to prepare of teaching environment. There was a decision to move forward with great anticipation of the meaningful research results of the basic data will be resulted in maintaining and improvement of good health for the nation of Laos in the future. It is our hope that producing this textbook will eventually become a policy for Health Promotion of Laos, and leads to maintain and improvement of good health of people in Laos.

As starting the postgraduate school curriculum, the time has come to see the greater fruit. By cooperation of both universities, it is our hope that this program will be developed from "International Cooperation Initiative, MEXT." With the anticipation of great future, we would like to move forward.

Practice of Health Sciences の出版にあたって

日本大学歯学部　学部長　大塚　吉兵衛

日本大学歯学部は、東京都の依頼を受けた NPO 法人のラオスにおける歯科医療のフィールド活動と歯科医学教育への一部協力・援助活動を３年前から始めました。

このＮＰＯ法人は日本大学歯学部の客員教授である国際歯科医学教育支援機構の宮田先生が主宰され，カンボジアやラオスでのフィールド活動への協力依頼に応じて，ラオスにきたことから始まりました。日本の大学教育の改革は１９９９年頃から始まり，特に医学，歯学の教育が大きく変わり，教育の質の向上や国際化が強く望まれるようになりました。

この時代の教育改革の経験を活かして，ラオスのヘルスプロモーション活動に協力できればと考え，本学部内で協力者を募りました。中島准教授，本橋准教授らが中心となり，２年前から文部科学省のプログラムである「国際協力イニシアチブ」にアプライし，その認可を受けて本格的にヘルスプロモーション活動を始めました。

はじめに，日本の歯科医学教育の現状を理解していただくために，ラオスの大学教員の方々に日本にお出でいただき，教育現場での活動状況を視察すると共に，教育プログラムについてのワークショップを体験学習しました。また，世界の感染症に関する講演会を開催し，ラオスでのヘルスプロモーション構築への理解を深めていただきました。この際には日本大学医学部の早川教授，麦島教授の協力もいただきました。

この間の相互訪問を繰り返していくうちに，今回の大学院修士課程設立の話がラオスヘルスサイエンス大学側から本格化する提案があり，伊藤教授を中心にして現在の学習状況を活かして，更にモチベーションを高く，インパクトのある学習をすすめる方針が示され，本学部もできるだけ人的協力をするようにプログラム策定をしてきました。

その一環として，基本的な口腔疫学調査，身体発育調査などを理解し，教育環境を整えるために，疫学調査方法に関する教科書「Practice of Health Sciences」を自作する作業が最も効果的学習方法であること，将来のラオスにおける国民の健康維持・増進の基礎データとして有意義な調査結果を得ることに繋がることを期待し，第一歩を踏み出すことにしました。この教科書策定が今後のラオスにおけるヘルスプロモーションの本格的な施策への取組となって，国民の健康維持・増進の助けになれば幸いです。

いよいよ本格的な大学院カリキュラムが完成し，今後の成果が期待される時がきました。両大学の協力の下，このプログラムが文部科学省の「国際協力イニシアチブ」事業から大きく発展していくことが期待されます。将来に大きな希望をもって進めていきたいと存じます。

Salutation from the project leader

Ichiro Nakajima, DDS, PhD. Project Leader,
Associate Professor, Nihon University School of Dentistry

To encourage educational support in developing countries, “International Cooperation Initiative” establishing the educational base project by Ministry of Education, Culture, Sports, Science and Technology (MEXT) investigates, collects, and systematizes educational knowledge and experience of universities and other educators. Along with these processes, building and verifying educational support models including the knowledge of our own country. It is a purpose of the project that is to produce the product group by publicizing these results in simple and useful manner. So that domestic and foreign supporters will be able to utilize such result and discover its effectiveness.

During a three-year-period from 2007 to 2010, Nihon University School of Dentistry/Medicine and University of Health Sciences launched problem solving style educational project under the MEXT project.

Based on these three years of achievements, textbook was produced and published by meeting current situation of oral health/medical field and lectures and self-study of child health and medical field in mind. It is our hope that medicine and dentistry education of Laos will be developed by this material. I would like to give a great appreciation to the international affairs division, MEXT and individual who supported this project.

February 2010

課題代表者からの挨拶

文部科学省「国際協力イニシアティブ」教育拠点形成事業は発途上国における教育協力促進のため，大学ほか我が国の教育関係者等が有する 教育研究上の知識や経験を調査・蓄積・体系化するとともに，我が国の知見を踏まえた教育 協力モデルの構築・検証を行い，それらの成果を容易に活用可能な形式で公開することに より，国内外の援助関係者が教育協力の現場で容易に活用可能かつ活用効果の早期発現が期待できる成果群を形成することを目的とした事業です。

平成 19 年度より平成 21 年度の３年間，本事業のもとで，日本大学歯学部・医学部は，ヘルス・サイエンス大学と「地域における保健医療・学校保健」を課題とする問題解決型教育プロジェクトを発足し，①小学校児童の健康に対する調査活動， ②プライマリ・ヘルス・ケア， ③健康情報のデータ・ベース構築などの教育支援事業を実施してきました。

これら３年間の活動実績をもとに，ラオスの実情に応じた口腔保健・医療分野と小児保健・医療分野の講義や実習を目的とした教科書を出版いたしました。本教材により，ラオスにおける医学・歯学教育の更なる発展を祈念いたしまして，本事業を支援してくださった文部科学省国際課をはじめ関係者各位に心からの感謝をいたします。

平成 22 年 2 月
課題代表者　中島一郎

Preface

Hirofumi Aboshi, DDS, PhD. Editor-in-Chief
Assistant Professor, Nihon University School of Dentistry

This textbook is produced as a positive outcome of the “International Cooperation Initiative Project, MEXT” which was implemented in 2007. The material is also to become part of a postgraduate program in health and medical studies at the University of Health Sciences, which is the only medical related university in Lao People’s Democratic Republic.

The textbook covers the meanings of, and presents disease prevention guidelines derived from Evidence-Based Medicine (EBM) and Evidence-Based Health Care (EBHC). These studies are considered crucial in the internationalization of medicine and medical related fields. It also explains the importance of creating databases of local diseases and health investigation outcomes, especially relating to childhood illnesses. Examples of case studies are presented using disease data that indicates the urgent need for improvement in health and medicine in Laos. Such result is anticipated to use as an assignment for thesis in postgraduate program.

It is all authors’ hope that professors at the University of Health Sciences will examine and revise the content of the textbook and develop a new medical/dentistry education curriculum, teaching materials, and study strategies; so that the university will be able to train medical staff for the society of Laos. In addition, it is hoped that the students will be able to obtain the medical knowledge needed to provide primary health care by utilizing this textbook. By using the medical information database, students will become able to collect the data, analyze, and write thesis by themselves.

Lastly, I would like to give deep appreciation to each and every member of staff of University of Health Sciences and Nihon University School of Dentistry and School of Medicine who supported, and contributed to the writing and research for the textbook. Also thanks to Ms. Nozomi Phonsavanh and Ms. Chanthasone Inthavong who devotedly translated the language to English and Lao.

February 2010

はじめに

本書は，平成 19 年度から実施されている文部科学省「国際協力イニシアティブ」事業の成果として，ラオス人民民主共和国における唯一の医療系大学であるヘルス・サイエンス大学の保健・医療分野の修士課程における教材の一部に資するために作成されました。

本書では，医療の国際化時代において重視される Evidence-Based Medicine(EBM)や Evidence-Based Health Care (EBHC)の考え方や疾病予防のガイドラインの在り方をメインに，さらには地域における疾病・健康調査や乳幼児期における発育歴のデータベース構築の重要性についても解説されています。また，ラオスにおける高い保健および医療ニーズを示す疾病データをもとに，ラオスの医学・歯学教育の現状を踏まえたうえでの Case Study モデルも作成されており，修士課程における論文の課題材料として利用されることが期待されます。加えて学生においては，本書を活用することでプライマリー・ヘルスケアに必要な医学知識を獲得し，医療情報データベースを活用して，自らの手でデータ収集や解析を行い，研究論文などを作成できるよう工夫されています。

今後は，ヘルス・サイエンス大学教員の方々が自発的に教科書の内容を吟味・改訂するとともに，医学・歯学教育カリキュラム，教育資源や学習方略などを新たに開発することで，社会人材資源として有為な医療人を養成されることを著者一同，心より期待いたします。

最後に，編集にあたり執筆ならびに調査協力にご尽力戴いたヘルス・サイエンス大学および日本大学歯学部・医学部の関係者各位，また，英語やラオス語との翻訳作業に献身的なご協力をいただいたポンサヴァン・のぞみ氏ならびにチャンタソン・インタヴォン氏に心から感謝の意を表します。

平成 22 年 2 月

編集委員長　網干博文

Authors (Listed in alphabetical order)

Editor-in-Chief
Hirofumi Aboshi
Assistant Professor, Department of Legal Medicine, Nihon University School of Dentistry

・**Nihon University, Japan**
Hirofumi Aboshi
Assistant Professor, Department of Legal Medicine, Nihon University School of Dentistry

Shigeharu Hosono
Associate Professor, Department of Pediatrics and Child Health, Nihon University School of Medicine

Hideo Mugishima
Professor, Department of Pediatrics and Child Health, Nihon University School of Medicine

Ichiro Nakajima
Associate Professor, Department of Pediatric Dentistry, Nihon University School of Dentistry

Masafumi Motohashi
Associate Professor, Department of Oral Health Sciences, Nihon University School of Dentistry

Masami Makimoto
Assistant Professor, Department of Pediatrics and Child Health, Nihon University School of Medicine

Takayuki Kawato
Assistant professor, Department of Oral Health Sciences, Nihon University School of Dentistry

Yoshiyuki Yonehara
Professor, Department of Oral and Maxillofacial Surgery, Nihon University School of Dentistry

・**University of Health Sciences, Lao PDR**
Bounghong Sidaphone
Vice Director, Faculty of Dentistry, University of Health Sciences

Phay Duangsy
Specialist in General Surgery, Faculty of Medicine, University of Health Sciences

Khamsing Sypraseuth
Specialist in E.N.T., Faculty of Medicine, University of Health Sciences

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Evidence Based Medicine and Clinical Epidemiology

1

MASAFUMI MOTOHASHI
Associate Professor, Department of Oral Health Sciences, Nihon University School of Dentistry
BOUNHONG SIDAPHONE
Associate Professor, Faculty of Dentistry, University of Health Sciences

Concepts and Steps

1. Introduction

In 1990, Dr. Gordon Guyatt introduced the term "Evidence-based medicine," to describe a paradigm shift in medical practice that stresses the role of rigorous, systematic evidence from clinical research in conjunction with patients' values and preferences in clinical decision-making.

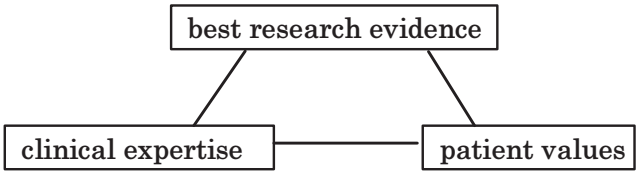
2. Definition of EBM

EBM is defined* as "Evidence-based medicine is conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients" (*David Sackett, McMaster University*).

* *D. L. Sackett et al. Evidence-based Medicine How to Practice & Teach EBM, Churchill Livingstone. 1997.*

Evidence Based Health Care (EBHC)

Evidence Based Health Care EBHC is defined as "Evidence-Based Health Care extends the application of the principles of Evidence-Based-Medicine to all professions associated with health care, including purchasing and management" (*the United States, the Department of Veterans Affairs*). Health care for people should be carried out base on the principles of EBM.



Model of the key elements for evidence-based clinical decisions *

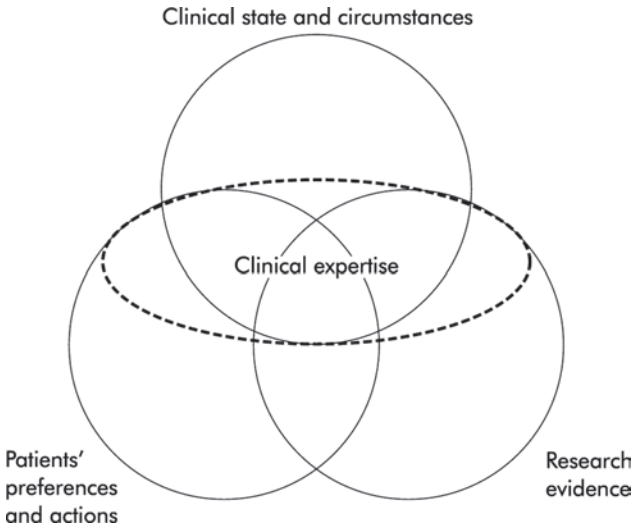
3. Components of EBM

Evidence-based medicine (EBM) is the integration of best research evidence with clinical expertise and patient values. Research evidence alone is not an adequate guide to

action. Rather, clinicians must apply their expertise to assess the patient's problem and must also incorporate the research evidence and the patient's preferences or values before making a management recommendation.

* *EVIDENCE-BASED MEDICINE How to Practice and Teach EBM 2nd Ed. 2000, D. L. Sackett and et al. p.1 Introduction*

This descriptive model has been replaced by a new, prescriptive model for evidence-based clinical decisions (*R Brian Haynes and etc. Clinical expertise in the era of evidence-based medicine and patient choice Evid. Based Med. 2002; 7; 36-38*).



The updated model for evidence-based clinical decisions

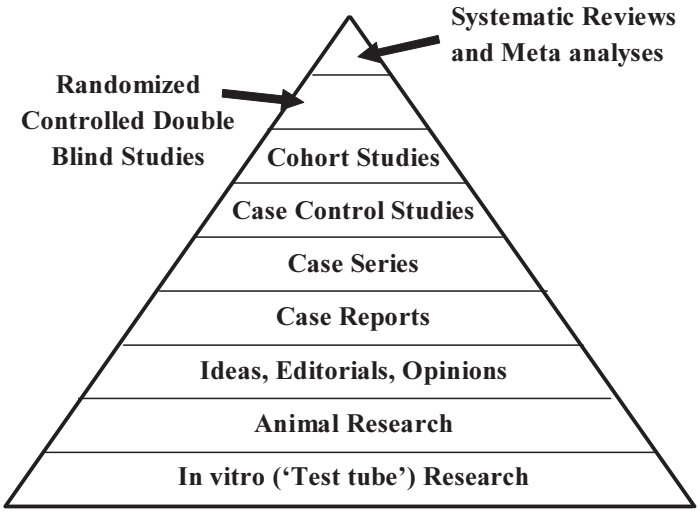
The figure depicts a more advanced model for evidence-based decisions, which have more recently been defined as "the integration of best research evidence with clinical expertise and patient values." This model is prescriptive rather than descriptive. That is a guide for thinking about how decisions should be made rather than a schema for how they are made. For instance, at present, clinicians' individual preferences (as distinct from clinical expertise) often play a large role in their actions, leading to large practice variations in managing similar cases.

When faced with critically ill patients with identical circumstances, different clinicians may, according to their preferences, institute aggressive life-prolonging interventions or withdraw life support. Our model acknowledges that whenever it is possible to do so, patients' preferences should be considered first rather than clinicians' preferences.

In the figure, the "clinical state and circumstances" of the patient replace "clinical expertise" as one of the key elements in clinical decisions; "patient preferences" is expanded to include patients' actions and is reversed in position with "research evidence," which signifies its frequent precedence. Finally, "clinical expertise" is overlaid as the means to integrate the other 3 components; thus, constituting the 4th element. We will describe each of the components, their order, and the role of clinical expertise in integrating them.

4. Hierarchy of Evidence

Not all research evidence is judged to be of equal value. There are hierarchies of research design that should be evaluated to have different levels of value in the decision making process.



Evidence Pyramid (*SUNY Downstate Medical Center, Brooklyn, NY)*

Oxford Centre for Evidence-based Medicine - Levels of Evidence (March 2009)
http://www.cebm.net/index.aspx?o=1025

Level	Therapy / Prevention, Aetiology / Harm	Prognosis	Diagnosis	Differential diagnosis / symptom prevalence study	Economic and decision analyses
1a	SR (with homogeneity*) of RCTs	SR (with homogeneity*) of inception cohort studies; CDR† validated in different populations	SR (with homogeneity*) of Level 1 diagnostic studies; CDR† with 1b studies from different clinical centres	SR (with homogeneity*) of prospective cohort studies	SR (with homogeneity*) of Level 1 economic studies
1b	Individual RCT (with narrow Confidence Interval‡)	Individual inception cohort study with > 80% follow-up; CDR† validated in a single population	Validating** cohort study with good††† reference standards; or CDR† tested within one clinical centre	Prospective cohort study with good follow-up****	Analysis based on clinically sensible costs or alternatives; systematic review(s) of the evidence; and including multi-way sensitivity analyses
1c	All or none§	All or none case-series	Absolute SpPins and SnNouts††	All or none case-series	Absolute better-value or worse-value analyses ††††
2a	SR (with homogeneity*) of cohort studies	SR (with homogeneity*) of either retrospective cohort studies or untreated control groups in RCTs	SR (with homogeneity*) of Level >2 diagnostic studies	SR (with homogeneity*) of 2b and better studies	SR (with homogeneity*) of Level >2 economic studies
2b	Individual cohort study (including low quality RCT; e.g., <80% follow-up)	Retrospective cohort study or follow-up of untreated control patients in an RCT; Derivation of CDR† or validated on split-sample§§§ only	Exploratory** cohort study with good††† reference standards; CDR† after derivation, or validated only on split-sample§§§ or databases	Retrospective cohort study, or poor follow-up	Analysis based on clinically sensible costs or alternatives; limited review(s) of the evidence, or single studies; and including multi-way sensitivity analyses
2c	"Outcomes" Research; Ecological studies	"Outcomes" Research		Ecological studies	Audit or outcomes research
3a	SR (with homogeneity*) of case-control studies		SR (with homogeneity*) of 3b and better studies	SR (with homogeneity*) of 3b and better studies	SR (with homogeneity*) of 3b and better studies
3b	Individual Case-Control Study		Non-consecutive study; or without consistently applied reference standards	Non-consecutive cohort study, or very limited population	Analysis based on limited alternatives or costs, poor quality estimates of data, but including sensitivity analyses incorporating clinically sensible variations.
4	Case-series (and poor quality cohort and case-control studies§§)	Case-series (and poor quality prognostic cohort studies***)	Case-control study, poor or non-independent reference standard	Case-series or superseded reference standards	Analysis with no sensitivity analysis
5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on economic theory or "first principles"

Produced by Bob Phillips, Chris Ball, Dave Sackett, Doug Badenoch, Sharon Straus, Brian Haynes, Martin Dawes since November 1998. Updated by Jeremy Howick March 2009.

Notes

Users can add a minus-sign "-" to denote the level of that fails to provide a conclusive answer because:

・***EITHER*** a single result with a wide Confidence Interval
・***OR*** a Systematic Review with troublesome heterogeneity.

Such evidence is inconclusive, and therefore can only generate Grade D recommendations.

*	By homogeneity we mean a systematic review that is free of worrisome variations (heterogeneity) in the directions and degrees of results between individual studies. Not all systematic reviews with statistically significant heterogeneity need be worrisome, and not all worrisome heterogeneity need be statistically significant. As noted above, studies displaying worrisome eterogeneity should be tagged with a "-" at the end of their designated level.
†	Clinical Decision Rule. (These are algorithms or scoring systems that lead to a prognostic estimation or a diagnostic category.)
‡	See note above for advice on how to understand, rate and use trials or other studies with wide confidence intervals.
§	Met when all patients died before the Rx became available, but some now survive on it; or when some patients died before the Rx became available, but none now die on it.
§§	By poor quality cohort study we mean one that failed to clearly define comparison groups and/or failed to measure exposures and outcomes in the same (preferably blinded), objective way in both exposed and non-exposed individuals and/or failed to identify or appropriately control known confounders and/or failed to carry out a sufficiently long and complete follow-up of patients. By poor quality case-control study we mean one that failed to clearly define comparison groups and/or failed to measure exposures and outcomes in the same (preferably blinded), objective way in both cases and controls and/or failed to identify or appropriately control known confounders.
§§§	Split-sample validation is achieved by collecting all the information in a single tranche, then artificially dividing this into "derivation" and
††	An "Absolute SpPin" is a diagnostic finding whose Specificity is so high that a Positive result rules-in the diagnosis. An "Absolute SnNout" is a diagnostic finding whose Sensitivity is so high that a Negative result rules-out the diagnosis.
‡‡	Good, better, bad and worse refer to the comparisons between treatments in terms of their clinical risks and benefits.
†††	Good reference standards are independent of the test, and applied blindly or objectively to applied to all patients. Poor reference standards are haphazardly applied, but still independent of the test. Use of a non-independent reference standard (where the 'test' is included in the 'reference', or where the 'testing' affects the 'reference') implies a level 4 study.
††††	Better-value treatments are clearly as good but cheaper, or better at the same or reduced cost. Worse-value treatments are as good and more expensive, or worse and the equally or more expensive.
**	Validating studies test the quality of a specific diagnostic test, based on prior evidence. An exploratory study collects information and trawls the data (e.g. using a regression analysis) to find which factors are 'significant'.
***	By poor quality prognostic cohort study we mean one in which sampling was biased in favour of patients who already had the target outcome, or the measurement of outcomes was accomplished in <80% of study patients, or outcomes were determined in an unblinded, non-objective way, or there was no
****	Good follow-up in a differential diagnosis study is >80%, with adequate time for alternative diagnoses to emerge (for example 1-6 months acute, 1 - 5 years chronic)

Grades of Recommendation

A	consistent level 1 studies
B	consistent level 2 or 3 studies or extrapolations from level 1 studies
C	level 4 studies or extrapolations from level 2 or 3 studies
D	level 5 evidence or troublingly inconsistent or inconclusive studies of any level

"Extrapolations" are where data is used in a situation that has potentially clinically important differences than the original study situation.

5. Five steps of EBM

(*CEBM: Center of Evidence Based Medicine Oxford UK http://www.cebm.net/index.aspx?o=1914*)

Evidence-based practice is primarily based on five well defined steps. The five steps of EBM were first described in 1992 and most steps have now been subjected to trials of teaching effectiveness.

1) Asking Focused Questions*:* translation of uncertainty to an answerable question

What makes a clinical question well built? First, the question should be directly relevant to the problem at hand. Next, the question should be phrased to facilitate searching for a precise answer. To achieve these aims, the question must be focused and well articulated for all 4 parts of its 'anatomy.'

(1) The patient or problem being addressed;
(2) The intervention or exposure being considered;
(3) The comparison intervention or exposure, when relevant;
(4) The clinical outcomes of interest.

Exposed: having the hypothesized causal factor of interest
Exposed group
: a group of persons having the hypothesized causal factor of interest

Non-exposed: not having the hypothesized causal factor of interest
Non-exposed group
: a group of persons not having the hypothesized causal factor of interest .

2) Finding the evidence: systematic retrieval of best evidence available

Training improves search performance and the quality of evidence retrieved. It improves searching skills. Searching the literature could improve the treatment of many medical inpatients, including those already receiving evidence-based treatment.

3) Critical appraisal: testing evidence for validity, clinical relevance, and applicability

Critical appraisal is the process of assessing and interpreting evidence by systematically considering its validity, results, and relevance to an individual's work. Within the last decade critical appraisal has been added as a topic to many medical schools, and the UK, the Royal College curriculum. Several continuing professional development ventures have been funded to provide further training. It teaches critical appraisal skills in health care settings.

4) Making a decision: application of results in practice

Many health professionals have recognized the need for instruction in evidence-based medicine. A curriculum intended to develop a resident-produced, evidence-based guideline for the care of patients with diabetes. Each resident was supervised going through the steps of evidence-based medicine: asking a clinical question, searching for the evidence to answer that question, appraising that evidence, and producing an evidence-based answer. These answers were then compiled into a guideline distributed in the residency practice. An evaluation of this curriculum using focus group and survey data showed that learners appreciated the skills and knowledge gained in devising guidelines in an evidence-based manner but were uncertain that their searches were complete.

The clinical evaluation of the guideline implementation showed improvement in several clinical markers of diabetes care. It teaches evidence-based medicine skills through a residency-developed guideline.

5) Evaluating performance: auditing evidence-based decisions

It appears logical that healthcare professionals would be prompted to modify their practice if given feedback that their clinical practice was inconsistent with that of their peers or accepted guidelines. One such strategy, audit, and feedback continues to be widely used as a strategy to improve professional practice.

Clinical Epidemiology for EBM

Clinical epidemiology is the science of making predictions about individual patients by counting clinical events in groups of similar patients and using strong scientific methods to ensure that the predictions are accurate. The purpose of clinical epidemiology is to develop and apply methods of clinical observation that will lead to valid conclusions by avoiding being misled by systematic error and the play of chance. It is one important approach to obtain the kind of information clinicians need to make good decisions in the care of patients (Robert W. Fletcher, Suzanne W. Fletcher, Epidemiology: the Essentials, Forth Edition).

Clinical epidemiology: the application of the logical and quantitative concepts and methods of epidemiology to problems (diagnostic, prognostic, therapeutic, and preventive) encountered in the clinical delivery of care to individual patients. The population aspect of epidemiology is present because these

individual patients are members of conceptual populations (Sackett et al. A basic science for clinical medicine).

1. Sources of error in epidemiological study

It is essential to identify and evaluate errors when carrying out study for making evidence and assessing the results of clinical observations. There are two sources of error, bias, and chance. Bias leads to systematic error and chance leads to random errors.

1) Bias (systematic error)

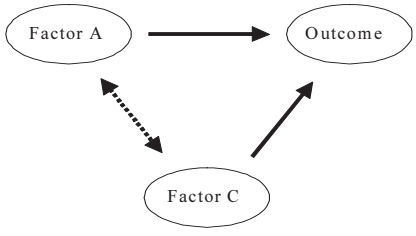
Bias is defined as any process occurring at any stage of an investigation tending to produce results which depart systematically from the true values. Bias or systematic errors will cause a systematic distortion of the true association sought. Systematic errors have predictable consequences. If the subgroup given a preventive measure is healthier than the comparison group, we could predict that more study subjects given a preventive measure will not have the disease of concern whether or not the preventive measure had a preventive effect. The strength of an association can be measured by computing relative risk from the data of cohort study. When confounding is not controlled by some methods, not only does magnitude of relationship come into question, but its very existent is subject to doubt.

Researchers and article readers have to be wary of bias error as well as chance of error when critically appraising a published epidemiological study.

(1) Confounding bias

A confounding factor (a confounder) is a variable which is related to the study factor (risk factor) of concern and simultaneously have an influence on the outcome (disease). A confounding factor (confounder) may mask an actual association or falsely demonstrate an association between the study factor and outcome where no real association between them exists. It is often said that alcohol intake may appear to be positively associated with laryngeal cancer by confounding factor of cigarette smoking. The factor of cigarette smoking has an actual association with laryngeal cancer as well as alcohol intake. People who drink alcohol may be at increased risk for laryngeal cancer because they may also smoke cigarettes. If confounding factors are not measured and considered, bias may result in. Consequently, the researcher falsely evaluates the size of effect of alcohol intake.

A confounder must be associated with both the exposure and the disease. It must cause the disease of concern or be predictive of the occurrence of the disease. And it is not just be an intermediate step in the causal chain between the exposure and outcome (disease).



Suppose we were studying a relationship between factor A and outcome, like smoking habit and oral cancer. We must be careful whether or not another factor C also causes the outcome. And we must also

be careful if the factor A have an association with another factor. If the factor A was true risk factor and the distribution was different between two groups who were exposed, and not exposed, the factor C would confound a demonstrated relationship between the factor A and outcome.

When investigating the effect of a study factor on the outcome factor (disease occurrence), and if a confounder distorts the true effect without controlling it, then we falsely judge the influence of the study factor on the outcome. If confounding can not be controlled in a cohort study concerning association between risk factor and disease occurrence, the calculated relative risk will depart from the truth. As a result, the effect of the factor will falsely evaluated.

Confounding bias occurs in a cohort follow-up study to determine whether children who eat sugary food more frequently show an increase of dental caries, though it is widely known that frequent consumption of sugary food is associated with dental caries. If the comparison group consists of persons who brush their teeth effectively than the exposure group for some reason, confounding bias may make frequent intake of sugary food appear high risk factor for dental caries than actual level. This is because the difference between two groups may be caused not only by the effect of sugary food eating but also by the effect of brushing habit.

Outcome: outcome is presence, occurrence of the disease, or the symptom of interest. It may be death or other event to be measured in the analytical study to investigate the causes of undesirable health event.

＜Control of confounding＞

Confounding bias can be minimized by stratification, randomization, and adjusting for the confounder using statistical analysis.

(2) Selection bias

Selection bias occurs when the study subjects are not representative of the target population from which conclusions are to be drawn. In case of control study, comparison of exposure of interest between case and control groups is the basis of analysis. Controls are chosen so as to be very similar to the cases for characteristic (age, gender, etc.) by matching. Odds ratio is used to evaluate association between risk factor and condition (disease).

Selection bias occurs when the selection of controls is not correct. Say that there are some factors other than a study factor which have an effect on the disease of interest.

When the distribution of such ~~a~~ factor is different between case and control groups, selection bias will occur.

Suppose, a case control study of alcohol consumption in relation to a particular type of oral cancer is done, one may choose controls from other patients without oral cancer. And if we carelessly do not perform matching about smoking habit or the distributions of smokers are different between two groups by unknown reasons, the result would be distorted. That produce odds ratio which

departs from the truth, which means that we may falsely evaluate the magnitude of the effect of study factor on the disease of interest. Thus, selection bias weakens validity like other bias.

Selection bias is controlled by matching in case-control study and by choosing a comparison group from the same population as an exposure group.

(3) Information bias

Bias occurs when the data collection is not performed in the same way among study subjects and groups. We can see good explanation of information bias (below) produced by BMJ (*British Medical Journal*) Group.

> Information bias
>
> Other major class of bias arises from errors in measuring exposure or disease.
> In a study to estimate the relative risk of congenital malformations associated with maternal exposure to organic solvents such as white spirit, mothers of malformed babies were questioned about their contact with such substances during pregnancy, and their answers were compared with those from control mothers with normal babies. With this design there was a danger that "case" mothers, who were highly motivated to find out why their babies had been born with an abnormality, might recall past exposure more completely than controls. If so, a bias would result with a tendency to exaggerate risk estimates (*http://www.bmj.com/epidem/epid.4.html*).

2) Chance error

Another source of error is due to chance. When we study the occurrence or causes of a disease in a group of community, we generally take a sample. When sampling, all men have an equal chance of being chosen (random sample). Study subjects should be representatives to whom our findings are applied. If samples are repeatedly drawn from a population, the findings like disease rate or exposure rate will differ from one another (sampling variation).

Chance error can be minimized by studying groups that are sufficiently large. The larger the sample size is the less the sample variation and probability that chance error may occur. The probability of chance error can be measured by using statistical significant test (chi-square test, t-test, confidential interval, etc) for further details of a variety tests, please read description in statistics text.

2. Epidemiological Study

Shirley Hutchinson described epidemiology as “Epidemiology is the study of the distribution and determinants of health related states or events in specified populations and the application of this study to control health problems. Epidemiology is a quantitative discipline based on principles of statistics and research methodologies.” (Shirley Hutchinson, Elizabeth T. Anderson, Judith McFarlane: Community Health Nursing: essentials of Practice 5th edition, p.20). He also described that “Many epidemiologic

studies have a disease morbidity/mortality focus; however, dimensions of health and well-being extend beyond these components. Epidemiology as practiced today has expanded its scope to induce investigation of lifestyles, health-promotion strategies, injury, environmental conditions, and other factors influence health. Public health practitioners use the knowledge gained from the epidemiologic process to guide decision-making and aid in developing an evaluating interventions for health promotion and disease prevention."

Epidemiology is essential for public health practitioners to gain good insight to health problems in a community. Epidemiology is essential for effective measure in community medicine. This discipline of epidemiology may be called public health epidemiology. On the other hand, the discipline of clinical epidemiology has been developed as the term 'evidence-based medicine' was first used in the late 1980s. The methods of epidemiological study which have been used in community medicine are used to solve the clinical problems. Disciplines of epidemiology cannot clearly be divided into public health epidemiology and clinical epidemiology. The reason is that conclusion of many epidemiological study can be used for both people and patients.

Epidemiology has two main branches: analytical and descriptive. The first stage of epidemiologic investigation focuses on describing disease distribution by characteristics relating to time, place, and person (*Mosby's Medical Dictionary, 8th edition. © 2009, Elsevier*). On the other hand, analytical epidemiology deals with a method for testing a hypothesis of the association between a disease and possible causes of the disease. It deals with not only diseases but every phenomenon relating to health issue and its cause. Epidemiology is the study of the distribution and determinants of disease, injury, and other health outcomes in human populations (End of this text, *Deborah Rosenberg, and Arden Handler: workbook, Analytic Methods in Maternal and Child Health, Module1, Descriptive Epidemiology and Statistical Estimation, http://www.uic.edu/sph/dataskills/publications/wrkbkpdfs/index.html*).

1) Methodology of epidemiological study

(1) Outline of Research Strategy for Public Health activities

Steps of investigation in public health activities can be summarize as follows.

Observation of people living daily life

↓

Evaluating necessity to investigate the health problems

↓

Descriptive study of health status of people

↓

Discovery of the health problems and evaluation of the problems

↓

Construction of hypothesis about the cause of the problem

↓

Analytical epidemiological study

↓

Development of measures to solve the problems

(2) Research question

Two types of research question may arise when we face health problems in people. “What is the distribution of the disease?,” “what are causes of the disease of interest ?” These questions are answerable by descriptive and analytical epidemiological studies, respectively. The answer to the former question is essential to evaluate the size of the problem and investigate the feature of the problem. The answer of latter is essential to discuss effective preventive measures.

【Questions answerable by descriptive epidemiological study】

Examples)

A. What is a frequency of abnormal growth in children ?
   - What is a standard of normal height and weight ?
   - What is height and weight distributions of children ?

B. What is a frequency of malnutrition ?
   - What is a frequency and a distribution of anemia ?

C. What is a frequency of a given disease of interest ?
   - What is a frequency of malaria ?

D. What is a distribution of dental caries of children ?
   - What rate of children have dental caries during one year?

【Questions answerable by analytical epidemiological study】

Examples)

A. What are causes of abnormal growth seen in children ?
   - Is malnutrition associated with abnormal growth ?
   - What extent each causal factor is associate the abnormal growth ?

B. What is a main risk factor of dental caries ?
   - What risk factors have an influence on dental caries occurrences ?
   - What is a strong risk factor of dental caries in three years old children.

(3) Constructing research hypothesis

When one wants to get scientifically reasonable answer to any question, it is essential to construct organized, research hypothesis from the question. Research questions are constructed from research hypothesis in analytical observational study.

Hypothesis is a statement in which an attempt is made to generalize about phenomenon around us. It must be testable and verifiable.

Hypothesis sentences should contain items as follows.

- Study design (cross-sectional study, cohort study, etc.)
- Study population

・Exposure (to hypothetical factor of interest)
・Outcome (disease or symptom)
・Measurement of exposure and outcome
(follow-up period of cohort study)

Null hypothesis is the hypothesis in a refutable form. If the hypothesis is constructed about the difference between effects of preventive measure, null hypothesis would be: *There is no difference between treatment A and treatment B.* Any difference between two treatments would prove this hypothesis is not true.

【Example of research hypothesis in analytical observational study】

In cross-sectional observation, dietary protein intakes
Study design *Exposure*

(obtained by 3-day recalls) in adolescent girls (aged 14-16 years)
Measurement of exposure *Study population*

of low serum iron level (defined as lower than 60μg/dl) are lower
outcome *measurement of outcome*

than those in girls of normal serum iron level.

(4) Measurement of disease frequency of a group of persons

Once any sort of health problem is detected, it is natural that one want to know about the size and feature of the problem (by descriptive epidemiology). If the problem is large one as a community problem, we will need some countermeasures to control the problem. In such a situation, It is necessary to investigate cause of the health problem by appropriate studies. A microbiological approach may be employed if infectious disease is doubtful or other approaches according to the situation. In any case, analytical epidemiological approach is almost always necessary to control problems. Hypothesis for the analysis will be constructed from descriptive epidemiological study. In epidemiology, measurement of health problem (disease) of a group of persons has two purposes.

A. Measurement of disease frequency of a population or a specified group of persons in descriptive epidemiology; seeking prevalence or incidence.
B. Measurements of disease frequencies of some subgroups to be compared for analysis in analytical epidemiology; also seeking prevalence or incidence.

2) Descriptive epidemiology

Descriptive epidemiology evaluates all the circumstances surrounding a person affected by a health

event of interest. The primary considerations for descriptive epidemiology are frequency and pattern. Descriptive epidemiology evaluates frequency and pattern of by examining the person, place, and time in relationship to health events. Descriptive epidemiology examines factors like gender, age, race, education, socioeconomic status, and availability of health services. The data of descriptive study are used to construct hypothesis about causal relationship between a disease and causal factor by analytical study.

3) Analytical epidemiology

Analytical epidemiology is defined as "Epidemiological investigations specifically aimed at studying the determinants of diseases in study populations." (*The European Food Information Council, EUFIC Nutrition Dictionary, http://www.babylon.com/affiliates/landing/download.php*).

Dr. John Snow (1813-1853), an English man made a first modern contribution to epidemiology. He showed the clusters of cholera cases in the London epidemic in 1854. Snow located source of a cholera outbreak in Soho, thus establishing the link between this infection and water as its vector. It is called "the Broad Street Pump Outbreak" Snow's hypothesis was that cholera is caused by an infectious agent carried in water. He observed nearly all the deaths had taken place within a short distance of the pump on the corner of Broad Street and Cambridge Street. A correlation between the source of water and the death rate were shown from map of deaths from cholera in Soho. Snow's theories were proved. On 7 September, a week after the outbreak began, Snow got the authorities to remove the pump handle. The number of infections and deaths fell rapidly.

Snow's study was a major event in the history of public health, and can be regarded as the founding event of the science of epidemiology. Recently, lifestyle-related chronic diseases have been steadily increasing, especially among people of developed country. Dental caries and periodontal disease are lifestyle-related diseases influenced by eating habit and daily tooth cleaning, as well as by oral bacteria.

【Definition of Lifestyle Disease】

Lifestyle disease: a disease associated with the way a person or group of people lives. Lifestyle diseases include atherosclerosis, heart disease, and stroke; obesity and type 2 diabetes; and diseases associated with smoking and alcohol and drug abuse. Regular physical activity helps prevent obesity, heart disease, hypertension, diabetes, colon cancer, and premature mortality. (*Medicine Net com. http://www.medterms.com/script/main/art.asp?articlekey=38316*)

Occurrence of life-style diseases are generally caused by many factors relating host and environment. Analytical studies reveal association between each causal factor and outcome factor.

(1) Cross-sectional study

A cross-sectional study is the simplest form of an observational study. Cross-sectional study or cross sectional analysis is a class of scientific research method for the analysis of data gathered

from a statistically significant sample of a population. It is used to estimate the relationship between an outcome of interest (cause-effect relationships) and population variables as they exist at one particular time. Both exposure (existence of factor) and outcome (disease or undesirable event) are measured at the same time. Regardless of the time period of data collection, data from each individual subjects is obtained only once.

Procedure of cross-sectional study

Make hypothesis about association between factor and disease of interest

↓

Determine measurement of exposure (factors) and outcome (the disease)

↓

Selected study population and sampling method.

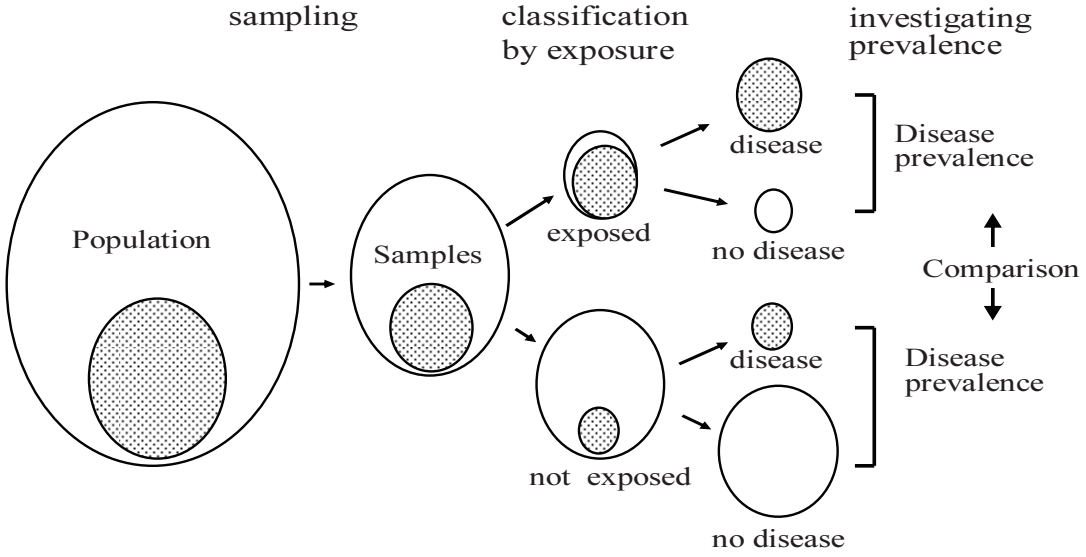
↓

Collect data of exposure and outcome

↓

Analysis including statistical hypothesis test

Design of a cross-sectional study



A cross-sectional study provides prevalence information, but not incidence. It means that cross sectional study can be good analytical study, when the current values of the exposure variables are stable over time, and represent the value present at the initiation of the disease process. For example, a historical study on fluorde in drinking water showed that excessive consumption of

fluoride for along period in childhood causes fluorosis (enamel hypoplasia caused by fluoride). In this case, cross-sectional study is valid because both exposure (fluoride) and outcome (mottled teeth) are stable overtime.

In cross sectional study, it made prevalence rates between exposure group and non-exposure group is compared. However, in many studies, several subgroups are generated by exposure level.

R. L. Weiss and A. H. Trithart showed a direct and consistent relationship between caries experience and the frequency of eating items of high sugar content or high degree of adhesiveness between meals was disclosed. (*BETWEEN-MEAL EATING HABITS AND DENTAL CARIES EXPERIENCE IN PRESCHOOL CHILDREN, Robert L. Weiss, D.D.S., M.P.H., F.A.P.H.A., and Albert H. Trithart, D.D.S., M.P.H., F.A.P.H.A.*)

In this study, subjects were classified into 5 groups, one non-exposure (dmf = 0), 4 exposure groups (dmf=1,dmf=2,dmf=3,dmf=4 & over) classified by level.

(2) Cohort study

Cohort studies are thought to provide strong evidence about disease etiology of various types of observational epidemiological studies. They can provide direct measurement of risk of disease development using incident rate. Cohort studies require follow-up observation of subjects over a period of time about disease development. There are two types of cohort studies, prospective and retrospective studies. Theoretically, they have the same approach to analyzing and reaching conclusion about association between etiological factors and disease.

A. Prospective cohort study

A prospective cohort study is one of the observational analytical types of study. Association between one or more factors can be evaluated simultaneously “cohort” means a group of similar individuals. The researcher follows over time a group of persons who initially do not have a disease under study. The simplest structure of this study is to compare two subgroups, an exposure group* and a non-exposure group**. Exposure and Non-exposure group can not always be classified clearly. Sometimes comparison is made among several groups who differ with respect to level of exposure, amount of alcohol drink per day, for example.

Prospective cohort study provides strong evidence about the causation of disease because of the establishment of temporal sequence between exposure and outcome (disease occurrence). In other words, study subjects who initially known to have a factor (exposure group) will be follow up, and a researcher will be able to assure that the disease would occur after the presence of the study factor.

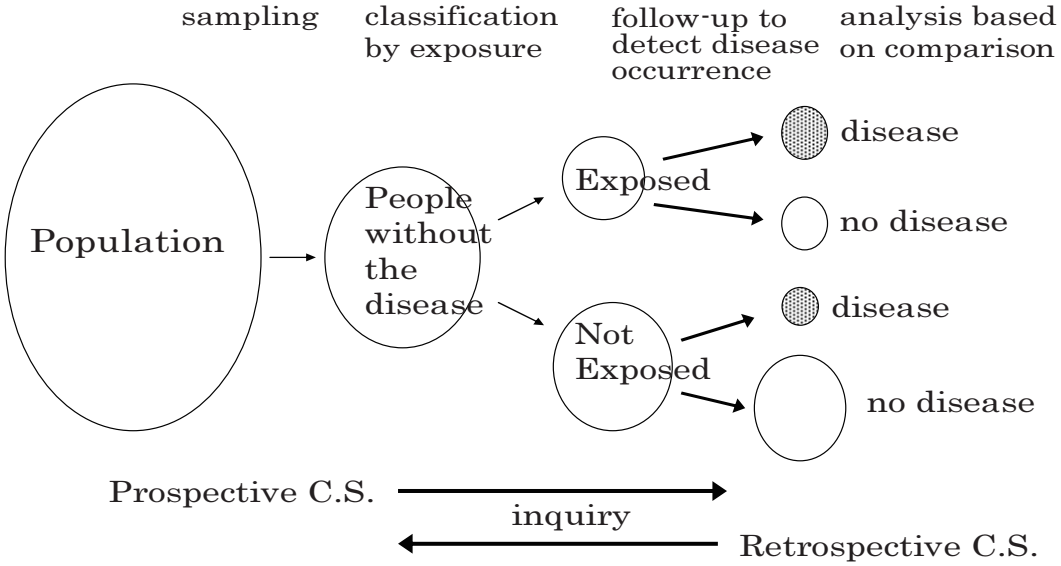
For example, one might follow a cohort of middle-aged truck drivers who vary in terms of smoking habits, in order to test the hypothesis that the 20-year incidence rate of lung cancer will be highest among heavy smokers, followed by moderate smokers, and then nonsmokers.

The prospective study is important for research on the etiology of diseases and disorders in humans because for ethical reasons people cannot be deliberately exposed to suspected risk factors in controlled experiments.

*: A group consisted of persons who have a disease of interest

**: A group consisted of persons who do not have a disease of interest

Design and procedure of cohort study



B. Retrospective cohort study

A retrospective cohort study is different from a prospective cohort study in the manner in which it is conducted. In general, the investigator collects data from past records and does not follow subjects toward future as is the case with a prospective study. In Retrospective Cohort Study, all the events required for analysis (exposure, latent period, and outcome) have already occurred at the starting point of study.

C. Risk index in cohort study

a. Relative risk

Relative risk indicates how many times higher the *risk* of the disease among exposed persons is, compared with unexposed persons. It represents how a factor increases risk of occurrence of a disease. It is ratio of incidence rate in exposure and non-exposure groups. It is called risk ration because it compares the absolute risk* of exposure and non-exposure groups.

$$\text{Relative risk} = \frac{\text{Disease incidence rate of exposure group}}{\text{Disease incidence rate of non-exposure group}}$$

*Disease incidence rate for one group is called absolute risk. It represents average probability

to have the disease of interest for a person in the group in a certain period..
Relative risk is calculated on the basis of contingency table in cohort study.

	[Occurrence of disease]		
	Occurred	Not occurred	Incidence rate
Exposure group	a	b	a ／（ a＋b ）
Non-exposure group	c	d	c ／（ c＋d ）

・Relative Risk ＝ $\dfrac{a／（a＋b）}{c／（c＋d）}$

【Interpretation of Relative Risk】

RR＜1.0　Factor assumes that it control occurrence of disease (preventively）.
＝1.0　Factor assumes that it does not affect occurrence of disease.
＞1.0　Factor assumes that it accelerates occurrence of disease.

b. Attributable risk

Attributable risk is interval of attributable incident rates of two subgroups in cohort study. It indicates the contribution of factor (presence of factor) to the occurrence of disease. In other words, it is a difference of risk which indicates how much risk (incidence rate) is added by exposure. To calculate this, find out the difference of incidence rate between exposure and non-exposure groups.

Attributable risk ＝ incidence rate of exposure group
－ incidence rate of non-exposure group

Following is a formula based on 2×2 contingency table.

	[Occurrence of disease]		
	Occurred	Not occurred	Incidence rate
Exposure group	a	b	a ／（ a＋b ）
Non-exposure group	c	d	c ／（ c＋d ）

・Attributable risk ＝ a / (a＋b) － c / (c＋d)

(Often indicated in %)

D. Analysis in cohort study

a. Principle

Once data is obtained, basic principle of analysis is similar in both prospective and retrospective cohort study as follows.

- Classification of the subjects into exposure and non-exposure group
  (or into several subgroups according to level of exposure)
- Comparison of incidences between exposure and non-exposure groups
  (or among several subgroups different in level of exposure)

b. Hypothesis test

Statistical hypothesis test is conducted for the association between factors and disease. If difference of disease incidence was observed between exposure and non-exposure groups, statistical significance test would be required to evaluate reliability. At the same time, possibility of error caused by chance will be evaluated with t-test, chi-square test and others.

E. Validity of cohort study

Validity of cohort study should be evaluated by evaluate possibility of bias: confounding bias, information bias, or others. Very often, we can know true association between exposure and outcome by control biases in the process of study. Confounding bias is caused by confounding factors which can be adjusted by multiple logistic regression analysis using adjusted odds ratios.

F. Major characteristics of cohort study

- It determines the priority of time in factor and outcome (result). By this, result of evidence becomes strong（high reliability）.
- Follow-up allows one to know the disease rate (occurrence rate) about disease condition.
- Relative risk can be calculated directly by disease incident rates.
- It is possible to examine several diseases.
- It takes time and is costly.

(3) Case control study

Case control study considers already occurred case as the group of cases at the point of starting research. Researcher will arbitrary select control group (comparative group) which does not have study disease but to make similar (matching) condition of age, gender, and cases. Then, examine association between risk factor and disease by comparing the exposure rate toward interested risk factor between groups with and without disease cases.

A. Odds ratio

Odds ratio is usually used in case control study. It is based on the information about existence of disease and risk factor that is a risk index which represents the relationship between risk factor and disease.

Case control study is one of the epidemiological analyses which studies association between risk factor and disease. Researcher will select case group and control group and its numbers. Without searching a number of people with disease in a particular group or arbitrary extracting the samples, it cannot estimate the disease and prevalent rate of a mother population. In order to examine the relationship between factor and disease, case controlled study will calculate the exposure rate of case and control group, then, find out odds and calculate the odds ratio.

Odds ratio indicates the strength of relationship between risk factor and disease. It is a ratio of exposure odds in case group and control group. As it is the same as relative risk, if odds ratio becomes larger than 1.0, then, it is assumed that a particular factor is accelerating occurrence of disease. Also, if odds ratio is smaller than 1.0 then, the factor which is risk factor in hypothesis is actually control factor (protective factor) which has preventive effect against disease.

	Case	Control
Exposure group	a	b
Non-exposure group	c	d

Exposure odds in case group $\dfrac{a}{a+c} \div \dfrac{c}{a+c} = \dfrac{a}{c}$

Exposure odds in control group $\dfrac{b}{b+d} \div \dfrac{d}{b+d} = \dfrac{b}{d}$

Ratio of exposure odds in case and control group

$$\frac{a}{c} \div \frac{b}{d} = \frac{ad}{bc}$$

【Interpretation of odds ratio】

OR＜1.0　Factor assumes that it control occurrence of disease (preventively）.

＝1.0　Factor assumes that it does not affect occurrence of disease.

＞1.0　Factor assumes that it accelerates occurrence of disease.

In case control study, it cannot calculate the incidence rate: thus, it cannot find the relative risk factor. However, odds ratio is used as presumptive value of relative risk factor. When odds ratio is employed in case control study, if prevalence rate is lower than below few %, then, the odds ratio will become similar to relative risk factor.

Followings are the major characteristics of case control study.

- Compare exposure rate to the risk factors between case group and control group.
- It is suited for studying the rare disease.
- About the case group: investigate existence of degree of factor retrospectively based on diagnosis, clinical record, and finding
- Researcher arbitrary selects control group.
- Comparative group does not have disease of interest. However, age and conditions should be similar to control group. There is a way to match gender, age factors of individual of case group with individual of control group one by one.
- It indicates association between factor and disease by odds ratio.

(4) Intervention study

A. Concept

Intervention study deals with effect of some artificial manipulation on health status of patients or people. It deals with effect of treatment or preventive measure in clinical setting. It also deals with effect of public health intervention for disease prevention. Intervention studies are different from observational studies which do not include artificial manipulation. Though intervention studies are different from observational studies, it also analytical like observational analytical studies.

The artificial manipulation is generally various kinds of treatment and preventive measure. Risk factors of disease of course should not be added as intervention from the ethical point of view. However weakening or elimination of risk factor, health instruction to change lifestyle to prevent metabolic syndrome for example, is an intervention which do not accompany ethical problem.

B. Study design

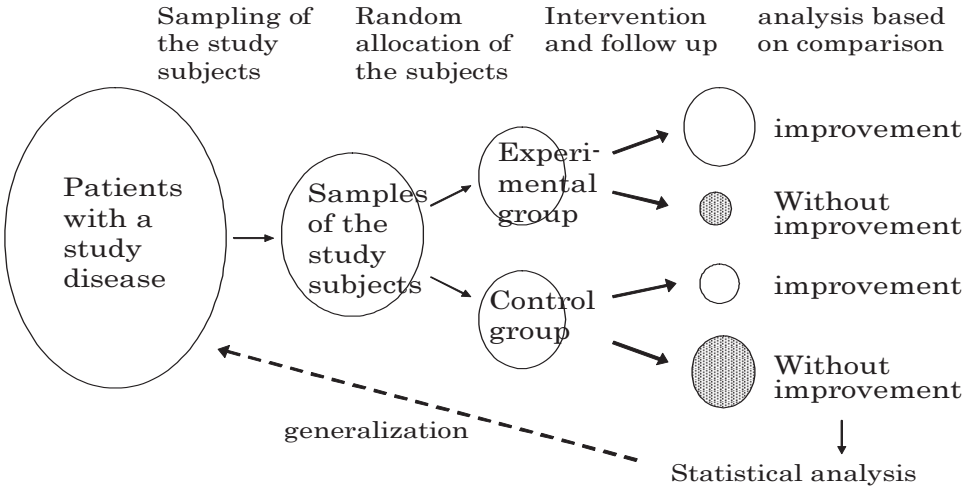
A principle of intervention study design is that comparison of experimental group and control group must lead to accurate conclusion about association between a intervention and outcome. It means that the natures or the characters of experimental and control groups which have an influence on outcome must be the same. If this principle is neglected, the study conclusion will biased and depart from the truth. We may overestimate or underestimate the effect of treatment or prevention.

C. RCT (Randomized Controlled Trial)

A randomized controlled trial (RCT) is a type of experimental study commonly used interesting the efficacy or effectiveness of healthcare services) RCT involve the random allocation of

different interventions (various treatments) to subjects. RCT is a type of study which provides the strongest evidence as one study. Analysis correctly performed by RCT does not include error derived from bias (selection bias, confounding bias and others) at all. It only includes chance error when allocating randomly. The figure below represents analysis procedure to evaluate the effect of treatment with the aim of cure. The procedure of RCT to test the effect of a preventive measure for healthy person is very similar to that aiming at cure. It will include the comparison of incidence rates between experimental and control groups.

Design and procedure of RCT



Double-blind trial

To avoid information bias, a double-blind trial is carried out. The patient does not know which treatment is being administered (the new treatment or another treatment). There might be no placebo effect (single-blind) I addition, when one researcher allocates a series of numbers of the patients to new treatment (experimental group) or old treatment (control group). The second researcher does not what they have been allocated to. He does not know which treatment is being administered, and by doing it, he observes the patients without prejudice and asks the patient's symptom in the same way. He treats the patients in the same way except the difference of treatment method. Thus, accuracy of outcome will be guaranteed. When the third researcher analyzes data statistically, it is called triple-blind test.

D. Ethical consideration

Safety and efficacy are prime concern for the patients and doctors. Ethical consideration for RCT is more important than for observational study. In principle, all patients or inhabitants should be guaranteed that they do not receive not only harmful effect but disadvantages in daily life. Sometimes, ethical consideration for intervention studies accompanies complex problems. Every type of intervention study needs ethical consideration from all aspects related to the advantage and disadvantage of the subjects in clinical and public health settings. In this section, only brief comments were made without multilateral discussion.

Case Study: Understanding Disease Epidemic by Epidemiological Index

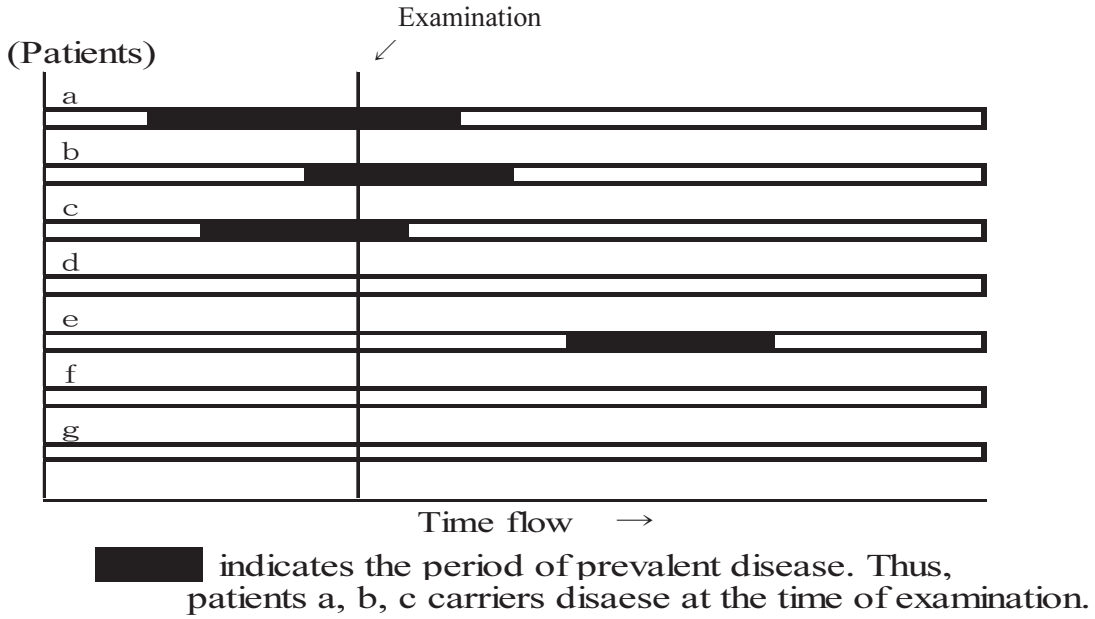
To evaluate epidemic of disease or compare disease frequencies of subgroups for analysis, we use epidemiological index. It is important to define target population to be investigated. In some cases, people living in the same area or country are subjects of investigation. In other cases, only population of a certain range of age under risk of a disease will be investigated. In many cases, randomly selected samples are examined and index is calculated.

Needless to say, proportion of out-patients having a disease of interest for total patients who visited a clinic does not provide epidemiological index.

1. Prevalence rate

It is a rate (percentage) of those who have a certain disease in one point of time of a defined population.

$$\frac{\text{Total number of persons who have a disease in one point of time}}{\text{Total number of persons investigated representing a defined population}} \quad [\times 10^{2\sim5}]$$



■ indicates the period of prevalent disease. Thus, patients a, b, c carriers disaese at the time of examination.

Note) The figure assumes a treatable disease such as gingivitis. In actual larger number of people are examined. 〔Edited by Japan Epidemiological Association 1996〕

Question 1. What is prevalence rate at the point of examination in the figure above?

Formula _____ **Answer** _____ %

Prevalence rate of dental caries is a rate of those who have tooth or teeth with caries experience in present teeth.

$$\frac{\text{Total number of persons with dental caries (treated and untreated)}}{\text{Total number of persons investigated representing a defined population}} \times 100$$

Note) Calculation of prevalence rate requires examination of dental caries only once.

【Examples of prevalence of dental disease】

A. Distribution of children according to he levels of gingivitis evaluated with PMA index in North Pakkading Primary School children

N:59

Levels	Number of children	Per cent
0	7	11.9
1 ～ 5	12	20.3
6 ～ 10	8	13.6
11 ～ 15	10	16.9
16 ～ 20	15	25.4
21 ≦	7	11.9

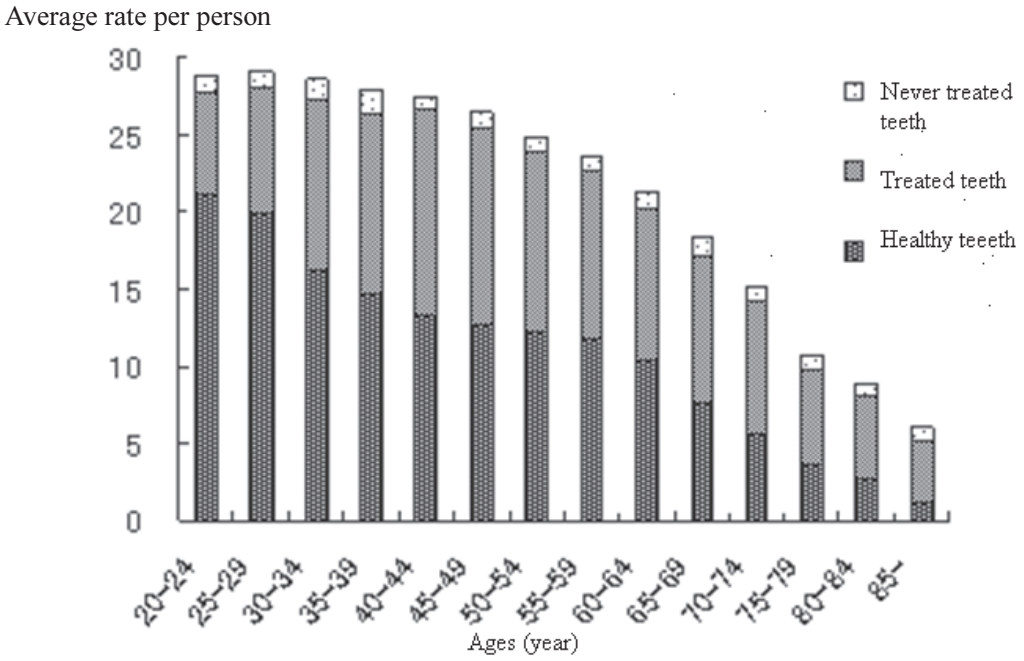
(*Oral Health Status of Children in a Rural Area of the Lao People's Democratic Republic. Journal of Oral Sciences, Vol. 51, No. 1, 131-135, 2009*)

B. The fact about healthy permanent teeth, treated / untreated condition of caries (*Report on the survey of dental diseases, 2005, Japan*).

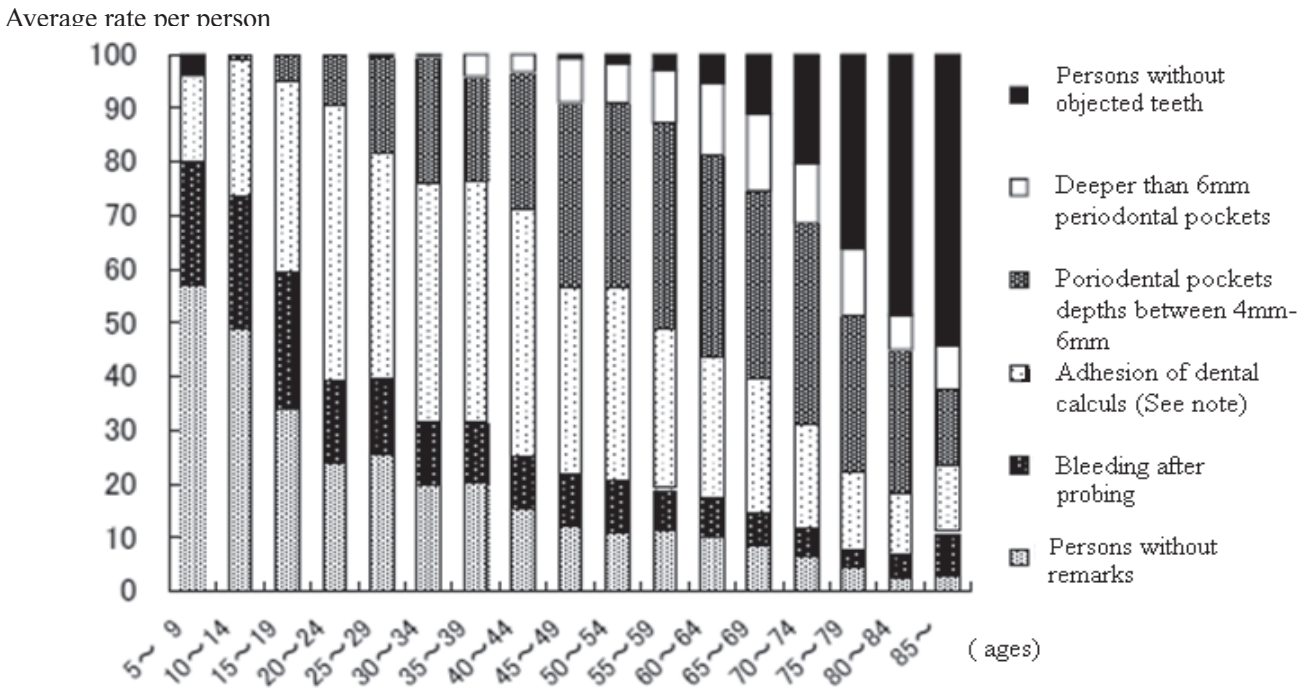
(%)

	without treated or untreated tooth or teeth	with treated tooth or teeth	with untreated tooth or teeth	**Prevalence rate**
Kindergarten	50	20	30	**50**
Primary school	36	31	33	**64**
Junior high school	44	30	26	**56**
High School	34	36	30	**66**

C. The condition of permanent teeth, healthy (sound), treated and untreated condition of caries (*Report on the survey of dental diseases, 2005, Japan*).



D. Remarks on the existence of gingival symptom (*Report on the survey of dental diseases, 2005, Japan*).



Note) those who have deeper than 4mm periodontal pockets are not included.

2. Incidence rate (also called as occurrence rate or attacking rate)

Incidence of a particular disease means that the rate of newly occurred disease in certain period of time of a defined population.

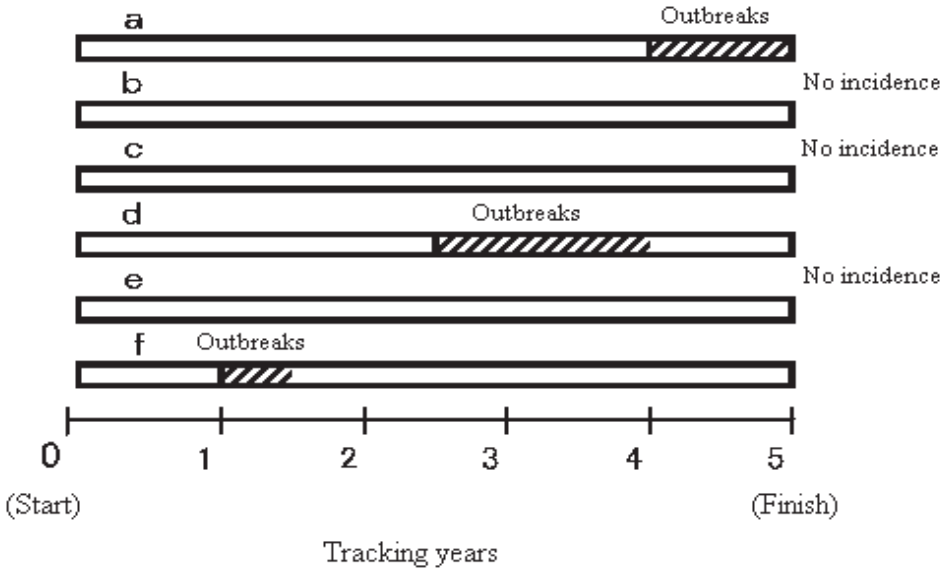
1) Cumulative incidence rate

If the same observation period is applied to all subjects, we calculate cumulative incidence rate. Depending on the frequency of disease occurrence, observation period is determined as 1 hour, 1 day, 1 week, 1 month, 1 year, or over a year. A disease which does not occur often need to be set as a longer observation period.

$$\frac{\text{Number of persons who developed disease during observation period}}{\text{Number of persons without disease who were initially determined as the observation subjects}} \quad [\times 10^{2\sim5}]$$

All subjects of cumulative incidence rate are persons whom investigator was able to follow up for a certain period of time. Observation period starts at the point when the disease of interest does not exist and ends when the second or last examination is carried out.

Definition and measurement of cumulative incidence



This figure indicates follow-up of A-F patients for 5 years. Among them, disease occurred in 3 patients〔Edited by Japan Epidemiological Association 1996〕. This is a figure which assumes treatable disease such as abnormality of the jaw.

Question 2. What is the percentage of cumulative incidence rate in the figure above?

Answer ＿＿＿＿＿＿＿＿ %

・Cumulative incidence rate of dental caries

$$\frac{\text{Number of patients with dental caries during a certain period}}{\text{Total number of persons at risk who had not dental caries at the start}} \times 10^2 \text{ (per / person, \%)}$$

Note) The denominator of incidence rate is basically the number of people who does not have disease of interests at the start of observation. However, in some cases, a number of populations at mid-point of the observation period are also used as the denominator.

2) Incidence Density

When observation period（follow-up period）differs from one another, incidence density can be used. Cumulative incidence rate requires 2 examination results. On the other hand, incidence density requires periodical examination to detect disease.

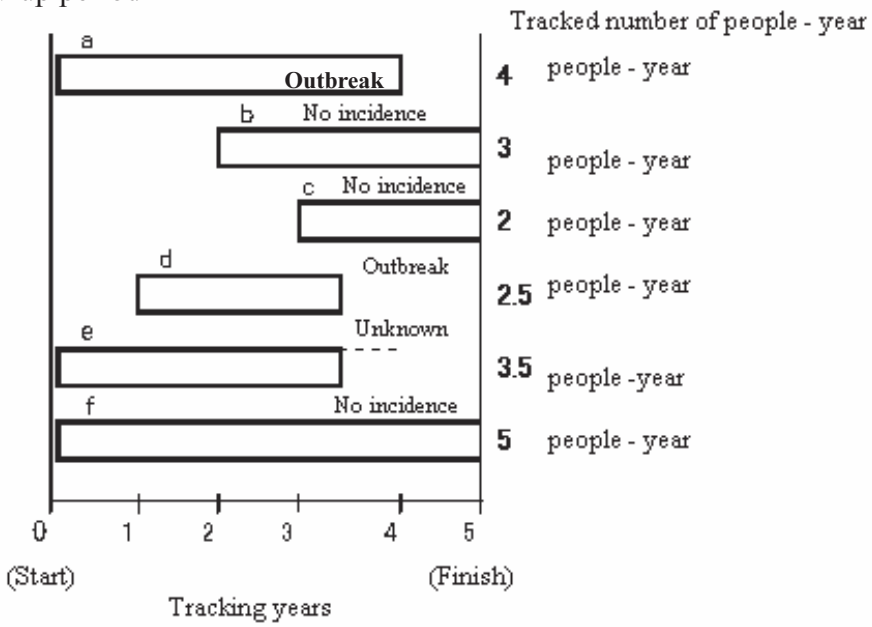
> Incidence density is used when the observation period of individuals differs from one to another.

<Person-year method>

When each period is set as 1 year, it is called person-year method. When one uses this method, examination should be done every year and it is necessary to examine occurrence of disease in last one year.

$$\frac{\text{Number of persons who developed disease during specified period}}{\text{Total person-time of observation (disease free)}} \ (\times 10^{2\sim5})$$

: Follow-up period



The figure represents a model showing different follow-up periods of 6 subjects of measurement and definition of incidence density.

Question 3. What is the incidence density of a particular disease which is indicated in the figure above? (It does not need to answer by %).

Formula _____ **Answer** _____ person / year

Question 4. Prevalence rate and incidence rate, which method does it accurately indicate the risk (danger) of disease occurrence?

Answer _____

Question 5. If the period of having disease becomes longer, prevalence rate and incidence density of which rate does it become higher?

Answer _____

・RID index: Relative Increment of Decay

RID index is an index which uses tooth surface as a unit and it measures increase in carious tooth surfaces for a certain period of time. It can be calculated by utilizing the 2 outcomes of examination. This method can be applied during the mixed dentition period, while permanent tooth is still erupting. RID index indicates the rate of tooth-surfaces which newly has become carious (decayed or filled) among sound tooth surfaces.

		Condition of tooth surface at point of time B			
		Sound	Decayed	Filled	Un-erupted
Condition of tooth surface at point of time A	Sound	$N_{1\text{-}1}$	$N_{1\text{-}2}$	$N_{1\text{-}3}$	$N_{1\text{-}4}$
	Decayed	$N_{2\text{-}1}$	$N_{2\text{-}2}$	$N_{2\text{-}3}$	$N_{2\text{-}4}$
	Filled	$N_{3\text{-}1}$	$N_{3\text{-}2}$	$N_{3\text{-}3}$	$N_{3\text{-}4}$
	Un erupted	$N_{4\text{-}1}$	$N_{4\text{-}2}$	$N_{4\text{-}3}$	$N_{4\text{-}4}$

$$\text{RID index} = \frac{N_{1\text{-}2} + N_{4\text{-}2} + (0.8)\ N_{1\text{-}3} + N_{4\text{-}3}}{N_{1\text{-}1} + N_{1\text{-}2} + N_{1\text{-}3} + (N_{4\text{-}1} + N_{4\text{-}2} + N_{4\text{-}3})/2} \times 100$$

Numerator : absolute increment of carious tooth surface

Denominator : sound tooth-surfaces at risk

【Meaning of signs in RID index formula】

$$\frac{\underbrace{N_{1\text{-}2}}_{\text{Sound} \rightarrow \text{decayed}} + \underbrace{N_{4\text{-}2}}_{\text{un-erupted} \rightarrow \text{decayed}} + (0.8)\ \underbrace{N_{1\text{-}3}}_{\text{sound} \rightarrow \text{filled}} + \underbrace{N_{4\text{-}3}}_{\text{un-erupted} \rightarrow \text{filled}}}{\underbrace{N_{1\text{-}1}}_{\text{sound} \rightarrow \text{sound}} + \underbrace{N_{1\text{-}2}}_{\text{sound} \rightarrow \text{decayed}} + \underbrace{N_{1\text{-}3}}_{\text{sound} \rightarrow \text{filled}} + (\underbrace{N_{4\text{-}1}}_{\text{un-erupted} \rightarrow \text{sound}} + \underbrace{N_{4\text{-}2}}_{\text{un-erupted} \rightarrow \text{decayed}} + \underbrace{N_{4\text{-}3}}_{\text{un-erupted} \rightarrow \text{filled}})/2}$$

Note) Sound means caries-free, natural intact tooth surface

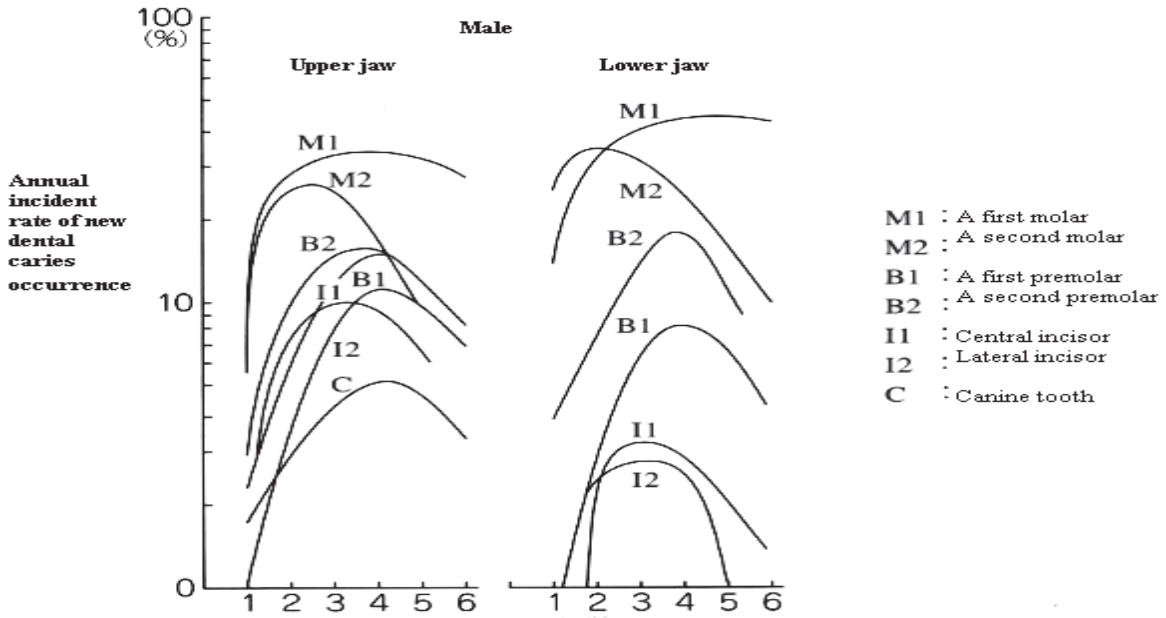
Question 6. Cross sectional study and cohort study, for which study can RID index be used?

Answer

【Example of study utilizing incidence】

Following figure was based on the result of oral examination of over 5,000 children aged 4-18 in Kingston, New York in 1944-1960. The annual probability of caries attack computed for various permanent teeth during the first 6 years of post-eruptive exposure is illustrated in the figure.

Consecutive curves on horizontal axis indicate the years of post-eruptive exposure. Dental caries attack rates were calculated for each observation period of 1year. Caries attack rate means probability of occurrence of caries in last one year for caries free teeth. Teeth once becoming carious are excluded from denominator and only caries-free teeth are included in denominator for each observation period of one year.



Provability curve for an annual caries occurrence on the permanent teeth (*Carlos et al, 1965*)

Question 7. For what reason the decline was observed for each tooth type?

Answer _____

Question 8. Among upper teeth, which tooth type is the most and the least sensitive tooth types?

Answer Most － (　　) Least － (　　)

Question 9. How many times is the highest attack rate greater than the least one?

Answer approx. times

Question 10. In central incisor of upper jaw, after eruption of teeth, when can it see the highest rate of caries?

Answer approx. later

3. Disease experience－ caries experience

Caries experience is used to describe quantity of destruction of dentition. This will include the present teeth in the month and the lost tooth by caries (life time caries experience).

Index of DMF like DMFT index measures life caries experience which indicates a characteristic of a defined population. It tallies up individual index value of caries experience by person–unit, tooth unit, or tooth surface–unit.

When calculating caries experience, all teeth will be the subject of examination (often exclude the 3rd molar), including tooth which is lost by caries. This is unlike GI (Gingival Index) which only examines particular teeth for its subject of examination.

In order to increase validity of the rate (how close to truth the measured outcome is?) or reliability (whether the measurement of the same condition always has the same result or not ?). Therefore, it is important to tally up the result by using examination outcome which meet the certain examination criteria.

Question 11. In epidemiological survey of caries, which of D, M, F should be recorded for the following teeth? (Enter only when it needs)

1) The first premolar which is found out to have been extracted for orthodontics.
2) A permanent tooth which has caries around fillings.
3) A tooth which is judged as having extrinsic stain in school health examination.
4) A caries which is applied preventive filling.
5) A tooth which is lost due to injury.
6) A tooth which is currently treating caries.

Study Design of Analytical Epidemiological Study and Risk Index

1. Cross sectional study

Cross sectional study is a method which compares prevalence rates between exposure group* and non-exposure group** It analyzes causation between factor and disease, or group difference of degree of risk factor.

*Exposure group: a group of persons who have a risk factor of interest

**Non-exposure group: a group of persons who do not have a risk factor of interest

1) Characteristics of cross sectional study

- It analyzes risk factor and study disease based on a point of time information.
- Study starts at the point when disease has already occurred in the group.
- It compares the difference of prevalence rates between exposure and non-exposure groups.
- It cannot establish time sequence of disease and risk factor (weakness). It means that the study cannot confirm existence of the risk factor prior to occurrence of disease: thus, its ability to show causality between factor and disease is not high. Its ability to prove the evidence is not high than cohort study and case control study: thus, the evidence of outcome is not strong.
- It can be practiced easier than cohort study (strength).
- It cannot provide the incidence rate or relative risk (weakness).

Question12. Would the primary school students who brush their teeth less frequently, less than once a day likely to have gingivitis?

To solve the question above, research was done in 6th graders of primary school, examining condition of gingiva once and average frequency of brushing a day. In this case, what is the risk factor which relates to the disease and what is the study disease?

Answer The risk factor _____

The disease _____

Question13. In this study, what index and examination criteria can be used to examine the subjects and to record the result?

Answer _____

Question 14. What is the type of this study?

Answer _____ study

Question15. If we use data of individual (frequency of brushing and prevalence of gingivitis) and association of risk factor (frequency of brushing) and disease (gingivitis), what subgroups can it be categorized and compared? What epidemiological index can be used for per/person to compare disease frequency between the subgroup?

Answer Method of grouping

Index for group comparison

2. Cohort study

1) What is cohort study?

Cohort study calculates the incidence rate separately, exposure group and non-exposure group. Then it measures causality of factor and disease by comparing the difference of incidence rates. First, patients without disease of interest were select and a factor or factors of interest will be examined. At the end of observation period, examination will be carried out again to detect disease occurrence during the observation period. Association between factor and disease can be indicated as relative risk.

2) Major characteristics of cohort study

- It can establish the time sequence of factor and outcome. By this, result of evidence
- becomes strong (high reliability).
- Follow-up allows one to know the incidence rate about disease epidemic.
- Relative risk can be calculated by incidence rates
- It is possible to examine several diseases in one study.
- It takes much time and is costly

3) Risk index in cohort study

(1) Relative risk and its calculation

Relative risk indicates how many times higher the risk of the disease among exposed persons is, compared with unexposed persons. It is ratio of incidence rate in exposure and non-exposure groups. It is called risk ratio because it compares two absolute risk* of exposure and non-exposure groups.

Relative Risk

$$\frac{\text{Disease rate of exposure group}}{\text{Disease rate of non-exposure group}}$$

Note) *Absolute Risk: disease incidence rate of a certain group is an average degree of danger for each person of the group to take study disease during a certain period.

Relative risk is calculated on the basis of contingency table in cohort study. It is calculated from incidence rates of study disease in exposure and non-exposure groups.

[Occurrence of disease]

	Yes	No	Incidence rate
Exposure group	A	B	a / （a＋b）
Non-exposure group	C	D	c / （c＋d）

$$\cdot \text{RR} = \frac{a / (a+b)}{c / (c+d)}$$

If relative risk becomes larger than 1.0, then, it is assumed that a particular factor has an influence on and promotes occurrence of disease. And if relative risk is smaller than 1.0 then, the factor which seems to be a risk factor in hypothesis is actually control factor (protective factor) which has preventive effect against disease. Judgment is done adding statistical method (confidence interval or p-value).

Relative Risk > 1.0　Factor assumes that it accelerates occurrence of disease.
= 1.0　Factor assumes that it does not affect occurrence of disease.
< 1.0　Factor assumes that it control occurrence of disease (preventively).

【Example of Cohort study】

Epidemiological study practiced in Gifu city in Japan in 1994 (there are slight change in description and figures). To obtain the data for study, it was decided to use data of one year and 6 months and 3 years old check-up records. Subject of study was among the three years old toddlers who were caries free at one and 6 months old. Observation period is from one year and 6 months to 3 years of age. Following chart indicates number of children who developed dental caries in accordance to the snacking habit.

［Occurrence of caries］

		Yes	No	Incidence rate
Snacking habit up to 18months old.	Irregular	180	259	(41.0 %)
	Regular	128	311	(29.2 %)

Question 16. What are the risk factor and study disease?

Answer Risk factor _____

Disease of interest _____

Question 17. What are exposure and non-exposure groups?

Answer Exposure group is _____

Question 18. Studied risk factor and occurrence of disease, which existed first?

Answer _____

Question 19. What kind of period was the incidence rate calculate for?

Answer _____

Question 20. Calculate relative risk from incidence rates of exposure and non-exposure groups.

Relative risk ＝ _____

Question 21. How many times children who snacked irregularly up to one and six months of age likely to have caries in comparison with the toddlers who had snacking regularly?

Answer _____ times

Question 22. Without relation to the study above, if calculation of relative risk is smaller than 1.0, how can you understand the relationship between factor of interest and occurrence of incidence?

Answer _____

(2) Attributable risk

Attributable risk is interval of attributable incident rates of two subgroups in cohort study. It indicates the contribution of factor (presence of factor) to the occurrence of disease. In other words, it is a difference of risk which indicates how much risk (incidence rate) is added by exposure. To calculate this, find out the difference of incidence rate between exposure and non-exposure groups.

(Attributable risk) : (incidence rate in exposure group – incidence rate in non-exposure group)

Following is a formula based on 2×2 contingency table.

[Occurrence of disease]

	Yes	No	Incidence rate
Exposure group	a	b	a / （a＋b)
Non-exposure group	c	d	c / （c＋d)

・Attributable risk ＝ a / (a＋b) － c / (c＋d)　　(often indicated in %)

Question 23. 2 by 2 table of the study example quoted above is there below again. Calculate **a**ttributable risk using incidence rates of two subgroups.

Answer Attributable risk %

［Occurrence of caries］

		Yes	No	Incidence rate
Snacking habit up to 18 months old.	Irregular	180	259	(41.0 %)
	Regular	128	311	(29.2 %)

3. Case control study

1) What is case control study?

Case control study considers already occurred case as the group of cases at the point of starting study. Researcher will arbitrary select control group (comparative group) which does not have study disease but to make similar condition of age, gender and other characteristics with cases (matching). Then, analysis is made to clarify association between risk factor and disease by comparing the exposure rates between case group and control group.

Followings are the major characteristics of case control study.

- Comparison of exposure rates to the risk factor is made between case and control groups.
- It is suited for studying the rare diseases.
- About the case group, researcher investigate exposure to risk factor retrospectively based on diagnosis, clinical record, and other findings.
- Researcher arbitrary selects control group.
- It indicates association between factor and disease by odds ratio.

Comparative group does not have disease of interest. However, gender, age and other conditions which already known to be associated with disease should be similar to control group. There is a way to match gender, age and other factors of individual of case group with individual of control group one by one.

As cohort study previously suggested, there seemed to be association between the risk factor of irregular snacking and dental caries. If the association between them is investigated by case control study, the result will become similar as following distribution.

Assumption: Case group are comprised of 120 children aged three who came to the dental office. Control group randomly selected 120 children from common people, aged three years old and without caries.

		［Presence of caries in three years old］	
		Yes case group	No control group
［ Regularity of snacking ］	Irregular	70	54
	Regular	50	66

Question 24. Cross table in case control study indicates the distribution of a risk factor in case and control groups. We can compare difference of exposure rates in case and control groups. However we can not compare prevalence rates nor can we compare incidence rates. Explain why cannot it be done?

Answer

Question 25. Calculate the rate of persons who have the risk factor (exposure rate) in case group and control group, then compare them.

Answer Exposure rate of case group %

Exposure rate of control group %

Following is the exposure rate of three years old children who are subject of previous cohort study.

Exposure rate of three years old with caries＝ 180／308 ×100 ＝ 58%

Exposure rate of three year sold with caries＝ 259／570 ×100 ＝ 45%

Compare the calculated result of case and control groups.

Note) In actual situation, exposure rate of case group and control group may change depending on coincidence of selection. Thus, the rate may not become so close as stated.

Question 26. Chi-square test is applied to a hypothesis test of difference of exposure rate between case and control groups, the P value was 0.039. Statistically, can it be said that the association between irregularity of snacking and occurrence of caries are statistically significant and why?

Answer Because

2) Odds ratio in case control study

Odds ratio is usually used in case control study as estimation of relative risk. It is based on the information about existence of disease and risk factors. It indicates the association between a risk factor and disease.

Case control study is one of the analytical observational studies which studies relationship between risk factor and disease. Researcher will select case group and control group and determine its numbers. Without investigating all persons with disease in a particular population, or without random sampling from mother population, it cannot estimate the disease prevalence rate, nor can it do incidence rate.

In order to examine the relationship between factor and disease, case controlled study will calculate the exposure rates of case and control group, then, find out odds and calculate the odds ratio.

Odds ratio indicates the strength of relationship between risk factor and disease. It is a ratio of exposure odds in case group and control group. As it is the same as relative risk, if odds ratio becomes larger than 1.0, then, it is assumed that a particular factor has an influence on and promotes occurrence of disease. Also, if odds ratio is smaller than 1.0 then, the factor which seems to be a risk factor in hypothesis is actually control factor which has preventive effect against disease. Judgment is done adding statistical method (confidence interval or p-value).

	Case	Control
Exposure group	a	b
Non-exposure group	c	d

Exposure odds in case group $\dfrac{\dfrac{a}{a+c}}{\dfrac{c}{a+c}} = \dfrac{a}{c}$

Exposure odds in control group $\dfrac{\dfrac{b}{b+d}}{\dfrac{d}{b+d}} = \dfrac{b}{d}$

Ratio of exposure odds in case and control group $\dfrac{\dfrac{a}{c}}{\dfrac{b}{d}} = \dfrac{ad}{bc}$

Odds ratio >1.0 Factor assumes that it accelerates occurrence of disease.

$=1.0$ Factor assumes that it does not affect occurrence of disease.

<1.0 Factor assumes that it control occurrence of disease (preventively).

In case control study, it cannot calculate the incidence rate: thus, it cannot find the relative risk factor. However, odds ratio is used as presumptive value of relative risk factor. When odds ratio is employed in case control study, if prevalence rate of study disease is lower than several %, then, the odds ratio will become very similar to relative risk.

Question 27. Calculate the odds ratio for following case. Then think relationship between irregular and regular snacking.

		[Presence of caries at 3 years old] Existed (case)	Not existed (control)
[Snacking habit at age 1 and half years old]	Irregular	70	54
	Regular	50	66

Answer Odds ratio＝

Characteristics of analytical epidemiological study

Following chart is the characteristic of epidemiological study, separated according to the type. We can review the procedure of study method and understand each characteristic.

【Method of epidemiological study and characteristics】

	Cross sectional study	Prospective cohort study	Retrospective cohort study	Case control study
Period	Short	Long	Relatively short	Relatively short
Cost	Little	Large	Some	Some
Study subjects	Many	Many	Many	Few
Analyzable factors and diseases		Rare factor is accepted	Rare factor is accepted.	Rare disease is accepted.
Study subjects	samples from a defined population	samples from a defined population initially without study disease	samples from a defined population without study disease at the start of observation	Persons having the study disease and selected persons of control
Indices obtained	Only disease prevalence is obtained	Disease incidence rate can be obtained.	Disease incidence rate can be obtained.	Disease prevalence and incidence rate cannot be obtained.
Study disease	It could discover the disease which is related to the factor of interest	It could discover the disease which is related to the factor of interest	It could discover the disease which is related to the factor of interest	Only study disease can be analyzed.
Time of measurement of exposure	After disease occurrence	Before disease occurrence	After disease occurrence	After disease occurrence
Comparison group	Persons not exposed to the rik factor of interest, not selected	Persons not exposed to the rik factor of interest, not selected	Persons not exposed to the rik factor of interest, not selected	Selected persons wiithout study disease
Risk evaluation	No direct risk evaluation	Relative risk	Relative risk	Odds ratio

Question 28. In cross sectional study, it is difficult to confirm that the factor existed before occurrence of disease, but why it can be confirmed by cohort study?

Answer

Question 29. Why does the case control study suited for rare disease study?

Answer

Case study for EBM in Oral Health

Research of Dental Caries in Primary School, Lao PDR
28-30 September, 2009
Dr. Bounhong Sidaphone and students of postgraduate school of University of Health Sciences

This is a research result of dental caries in one of the primary schools in Lao PDR.
State what research/study method is necessary from the research results.

Include following steps:
1. Discover problems in the present research.
2. What information obtainment is necessary for the research?
3. What study method is necessary for the further study?
4. Plan the study design.

Dental Caries in children at Pakading district, Borlikhamsay Province 2009

Site: Thongnamy primary school,
Pakkading district ,
Borlikhamsay province

Background

Thongnamy primary school locates in Pakkading District that far from District Hospital about 40 Km and the majority of the students are ethnic groups.

There is very few published Information about the conditions the need of prevention oral diseases.

Objectives

To measure the prevalence of primary and permanent dental caries in male and female.

To measure the prevalence of primary and permanent dental caries in 5-8, 9-12 and over13 years old.

Material and Method

- Cross sectional survey
- Oral examination
  - Explorer
  - Mouth Mirror
  - Tweezers
  - Gloves,
  - Mask
  - Torch light
- Location : Thongnamee primary school
- WHO guideline were modified
- SPSS

dmft & DMFT

	dmft		DMFT		
	d	f	D	M	F
N	1730	0	1046	36	0
Mean	1.63	0	0.98	0.03	0
Total	1.63		1.02		

Results

Gender	N	Percent
Male	574	54.2
Femal	486	45.8
Total	1060	100

primary teeth

Gender	N	Mean	Std Deviation
Male	573	1.59	2.49
Female	486	1.68	2.61
Total	1059	1.63	2.546

Permanent teeth

Gender	N	Mean	Std Deviation
Male	594	0.96	1.57
Female	485	1.10	1.54
Total	1059	1.02	1.56

Dental Caries in Primary and Permanent Teeth

Age	N	Mean	Std Deviation
5-8	415	2.89	3.12
9-12	553	0.93	1.72
13	91	0.14	0.78
Total	1059	1.63	2.54

Discussion

The average of dental caries in primary and permanent teeth along with gender female > male.

The average of teeth per person of dental caries along with the age group 5-8 years old and 9-12 years old (0.93,2.89) were found the higher of the of dental caries.

However, over 13 years old age group had reduced of dental caries.

Conclusion

Total of the 1060 students of Thongnamee primary school (Pakkading district) found that number of the male were a little higher than female respectively.

when look for average of dental caries along with the gender in primary and permanent teeth found that female were a little higher than male .

Mean of dft is higher than DMFT but it does not exceed WHO limit of 3.

Observed poor oral hygiene.

Absence of filling is disturbing as if left untreated can have measurable impaction children's daily life in rural areas such as eating , social interaction and doing school work

Somatometry 2

HIROFUMI ABOSHI
Assistant Professor, Department of Legal Medicine, Nihon University School of Dentistry

Introduction [1)]

Anthroprometry contributes information to enable an understanding about the size and form of the human body irrespective whether the object of the measurement is a living body or bones. Therefore, the method is not only employed in anthropological studies that are related to individuals and groups but it is employed by wide range of researchers in the medical field including forensic medicine, public health, and other study fields such as clinical medicine, physical education, human engineering, or textile sciences.

1. The "Martin's Method"

Current anthroprometry is based on the "Martin's method", however, there are a number of ambiguous and incoherent points in some of the descriptions. Martins's text "Lehrbuch der Anthropologie" (first published in 1914) was wholly revised by Rainer Knussmann in 1988 as "Anthropologie-Maartin/Knussmann". Somatometry text have been written by R. Knussmann and human bone measurement by Gunter Brauer.

In Martin's method, items measured are independently numbered from 1 in both the head and the body (any area below the jaw). If the number 1 measurement in the head is defined as "Head length", the same number 1 becomes "Height" in the body. When looking at these numbers we cannot automatically distinguish which part of the body is being referred, therefore, when measuring the whole body including head and mentioning two parts simultaneously, it is recommended to add the letter "C" (initial letter of cephalometry) for the measurements of the head and face, and to add the letter "S" (initial letter of somatometry) for body measurements. For example, the above mentioned measurements would become C1 for 'head length' and S1 to denote height.

Martin's standards defined that the left side of the head and the right side of the body should be measured. More recently, most examiners worldwide measure on left side the body only. When an individual uses somatometry measurements it is presupposed that they have existing general anatomical knowledge. Without having a minimum knowledge of bones and muscles of the human body it is impossible to

measure the size of a body part accurately. There are difficult associated problems such as measurement error, but it is omitted in this section. See another reference for the data analysis issues.

2. Standard planes

1) Anatomical planes

The anatomical position is the standard reference position of the body used to describe the location of structure.

Three major groups of planes pass through the body in the anatomical position (Fig. 1)

(1) Frontal or coronal planes are oriented vertically from right to left and divide the body into anterior and posterior parts.

(2) Sagittal plane also is oriented vertically, but is at right angles to the frontal plane and divides the body into right and left parts.

(3) Transverse or horizontal planes divide the body into superior and inferior parts.

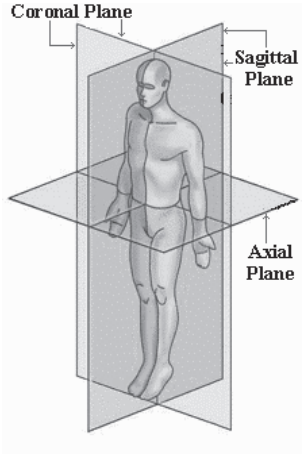


Fig.1 Anatomical planes [2)]

2) Frankfort plane ….. Fig.2

A surface that is determined by both left and right tragion (t) and left orbitale (or). It is set only for the head, but many other reference points relate to this plane. The name Frankfort horizontal plane indicates the condition of horizontal plane being parallel to the floor.

Tragion (t) is the point situated in the notch just above the tragus of the ear. In cephalometric analysis, this landmark located at the superior margin of the tragus of the ear.

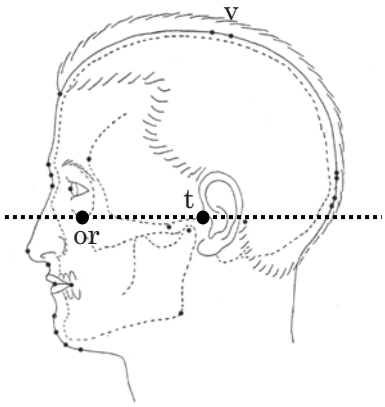


Fig.2 Frankfort plane

3) Position

Standing position ; (Fig.3)

In standing position, the position put palms forward is called "Anatomical posture" (Fig.4).

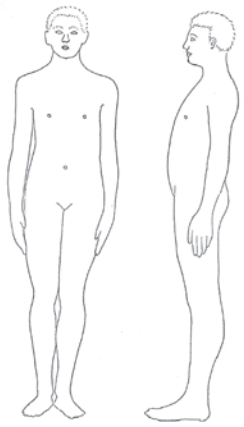


Fig.3 Standing position

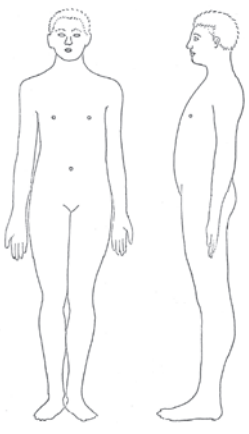
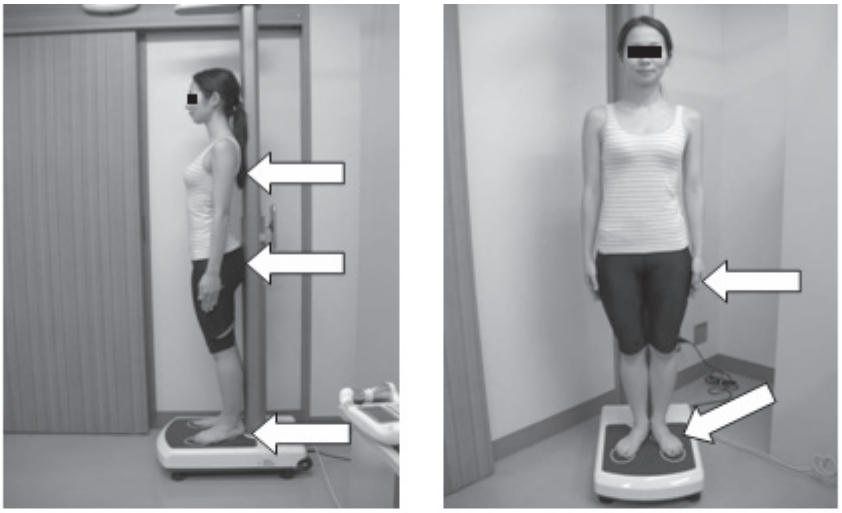


Fig.4 Anatomical position

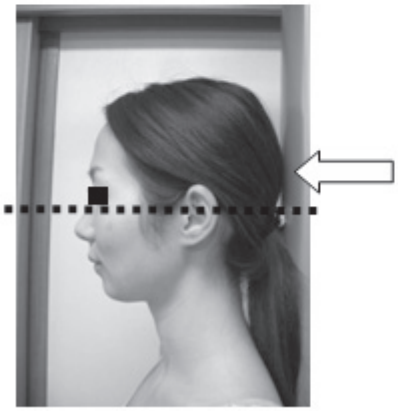
Standing Position for Measurements

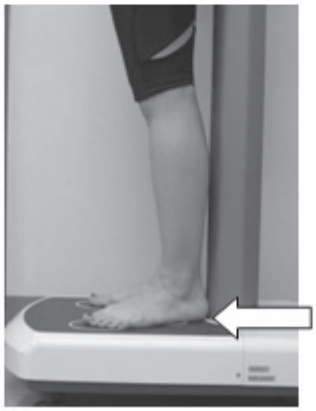
The majority of measurements are recorded with the patient (living) in the standing position.

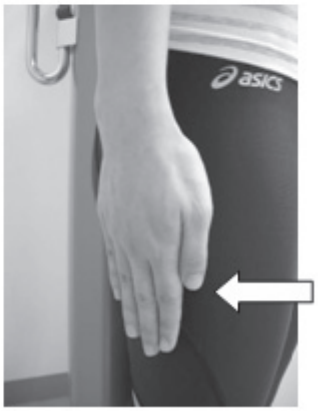
1) Measurements should be taken during the “resting period” (this is the time just between inhalation (breathing in) and exhalation (breathing out)).
2) Keep the head horizontal in Frankfort plane.
3) The head should be positioned to the front (adjust the midsagittal plane of head to that of the body).
4) Let the subject assume a relaxed posture.
5) Place arms vertically to the floor.
6) Turn the palms inside toward the thigh.
   (Depending of the point being measured, decide to attach or detach palms from thigh at a given time)
7) Straighten fingers and have contact between all fingers.
8) Straighten knees (over time if the subject gets tired or sore one knee at a time can be bent to a resting position).
9) Put heels on the ground. Open both left and right toes naturally.



【Proper Standing Position】







【Improper Positions】

Equipments for Measurement

1. Anthroprolometer (Fig.5)

A tool which is used to measure vertical distance. Many somatometry measurements developed by Martin utilize this device. Currently, the measuring equipment which is in the school infirmary is called a stadiometer. A digital device which can automatically measure stature and weight simultaneously is also available. (Fig.6)

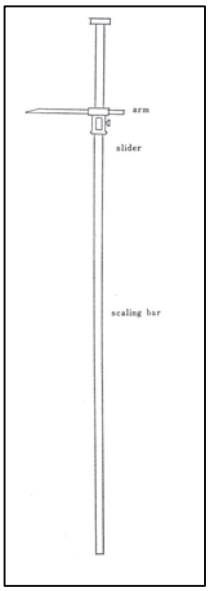


Fig5 Anthropolometer

Fig.6 Digital device for height and weight measurements

2. Sliding Caliper -abbreviated-
3. Spreading Caliper -abbreviated-

4. Measuring tape

Used to measure circumference and surface of the body. Originally made with steel or cloth, however, cloth often became stretched while it was being used and was therefore inaccurate. Currently tapes are made of plastic or a cloth wrapped with plastic, which does not stretch and it is not as uncomfortable for the subject as steel. For outside research as a substitution for the stadiometer it is possible to measure by sticking a measuring tape on the wall.

5. Skinfold caliper -abbreviated-

6. Weighing scale

A device which measures the weight of the whole body. There are two types of scales: spring scales and beam scales. The beam scale can measure weight more precisely and it was originally used for measuring baby's weight in the hospital, but the major disadvantage is that it is very time consuming. In order to complete the measurements in a short period of time, then, the spring scale is most commonly used. Another disadvantage of the beam scale is following repeated use the starting point moves from zero, so there is a need to inspect and recalibrate the scale often. In recent years, digital scales are mostly used, and as a result, accuracy of the measurement is improved. However, when one is using the digital scale, one should read the instructions carefully and understand the characteristics of the equipment in advance.

Selecting Items for Measurement

Most somatometric measurements are intended for group comparisons and not for individual analysis. Therefore, when one decides the items for measurement, one should take into consideration the following issues:

1. Possibility of comparison

The data analysis should use the same information that is collected via measurement. It is ideal if the same person can do the data collection (i.e. measure the sample) and the data analysis, however, this is usually impossible. As a result, one can only compare current data against data which someone else has

provided. Prior to examination, one should check what methods were employed in the other data set and what measurements were used, and use the same measuring methods as much as possible.

2. Time constraints

If it is necessary to measure a large number of subjects in a limited time there will be restrictions on the amount of measurements that can be recorded. This is why one should work out a way to shorten the measuring time. For instance, one can think through the order of the measurements such as when measuring is started with a particular instrument all measurements using that instrument are completed at the same time. Also, if there are experienced assistants examination time will be shortened.

3. Cooperation of examinees

Having good cooperation from examinees will not only shorten the examination time but will also guarantee accurate data: thus cooperation is necessary. Generally, it should be understood that children who are under 5 years of age and aged people who are over 70 years old will take double or more time. Having assistance for measuring will facilitate more accurate data.

Measuring the body

When measuring the body part, it is the general rule that the examinee wear only underwear or is naked. If female examinees are uncomfortable or it is a local custom that females be covered they should be allowed to wear a thin cloth such as a slip. It is important to prepare appropriate slips before hand and have all examinees them, this way all examinees will be measured under the same conditions. If an examinee objects to meet such conditions, then the examiner should record what clothing was worn.

【Selected items – [Martin's number]】

Height ［1］

Weight ［71］

* The following items are also frequently measured.

・Sitting height:［23］

・Trunk length:［27］＝［4］－［6］

（［4］: Suprasternal height, ［6］: Symphysial height)

・Chest circumference:［61］

1. Stature (Height) ［1］

〔Def.〕In standing position, it is the vertical distance from standing plane (plr) to vertex (v), to top of the head.

Stature is measured in the standing position (Fig.3). The examinee's ears and eyes should be level with each other. Have the examinee stand with the straight head and median sagittal plane straight. The upper body is placed in a natural position, straighten the fingers and turn the palms inwardly and attach palms to the body. Straighten the knees. Both left and right heels are put together and naturally open the toes. Shoulders should be relaxed and measure the height in the moment of pause after breathing out. In the supine position, the height may become 1-2 cm longer than in the standing position. One's height is the greatest when one wakes up in the morning and there are few centimeters difference in height before one goes to bed at the end of the day.

Martin recommends to measure height from the front but whether it is measured from behind or side, it does not matter. However, when one is checking the posture of the head it is advisable to stand an anthropometer in the front or right behind the examinee. This will make easier for examiner to measure. One should be careful when an anthropometer is placed behind the examinee as sometimes the examinee leans over and the posture becomes unnatural. The examiner should be aware that if the examinee postures the jaw forward height becomes shorter, but if the jaw is pulled back height generally increases. If examiner is paying too much attention to examinee's head position, it might result in bent knees, or heels being raised. Thus examiner should recheck all body positions before recording the measurement.

An anthropolometer is not used to measure height in schools or at work. Instead, a so called stadiometer is often used to measure the height, although it is acknowledged that the measurement is often greater larger than that recorded by an anthropolometer.

The reasons for this are:

1) the anthropolometer has a width of 1mm at the vertex (V), so it can be placed closer to the skin, while the stadiometer has a thicker plate (up to a few cms), so the thickness of hair is also included in the measurement.
2) with the stadiometer, the examinee often leans on the pillar. There is a report that such behavior makes the value larger (Daman 1964).

If examinees require assistance to stand or are elderly and cannot stand in correct standing position, another measuring method should be utilized. Even when examiners know there is a possibility of inaccuracy there are some situations where it is better to measure along the back or body by measuring

tape. It is always necessary to record measuring method.

2. Weight [Body weight] ［71］

〔Def.〕 Weight of the whole body when naked.

In many cases only an approximate value is needed; thus, often weight is recorded with clothing worn. When variation in weight is necessary, measurements should be repeated with the same clothing. Conditions which effect weight fluctuation need to be controlled such as measuring the weight immediately preceding or following meals, excretion, bathing, exercise, and so forth.

Index method

Individual values may not accurately reflect growth and conditions of nutrition intake. For instance, even if the weight is heavier than the average value, if the height is much taller than average, the child's condition is concluded as "skinny". If several single data are combined and expressed by index, such disadvantage will be avoided. The indices which represents physical features, the Kaup index (BMI: body mass index), and the Rohrer index, for fatness are used.

- Kaup index : $(W/H)^2 \times 10$
- Rohrer index : $(W/H)^3 \times 10^4$

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1. Anthropometry Ⅰ Somatometry (1991): Anthropology 13 vols. And 3 additional vols. 13 ed., Yuzankaku,Tokyo.
2. Dr. Russel D. Caram: Chiropractor (http://drcaram.com/spinal-anatomy-overview/)

Child Growth and Nutrition 3

SHIGEHARU HOSONO[1] and HIDEO MUGISHIMA[2]

Associate Professor[1] and Professor[2], Department of Pediatrics and Child Health, Nihon University School of Medicine

Growth Chart and Nutrition Status

1. What is growth chart?

Growth charts are one of the essential components of the pediatric toolkit.

Growth charts show the degree of physical development. Growth charts consist of body weight or body height (length) on the y-axis and age on the x-axis; there are two versions of growth charts for boys and girls. There are two standard curves of growth charts: one is a percentile method and the other is a standard deviation method. The percentile curves are internationally-accepted standard. The percentile curves can be constructed without normal distribution mode. A percentile is the value of a variable below, which is a certain percent of observations fall. These curves on the growth charts are consisted of 7 curves; 3%, 10%, 25%, 50%, 75%, 90%, and 97%. A space between 2 adjacent curves is called channel. So the 25th percentile is the value (or score) below which 25 percent of the observations may be found. The 50th percentile is also known as the median. Both extremely-high and -low values cannot be evaluated on the percentile growth charts.

On the other hand, standard deviation curves can be constructed when the data is normally distributed. It may be thought of as the average difference of the scores from the mean of distribution, how far they are away from the mean. A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data is spread out over a large range of values. These curves on the growth charts are consisted of 5 curves; +1SD, +2SD, Mean, -1SD, and -2SD. The main feature of the standard deviation charts is easy to estimate the data because of its capability of calculation. However, there is no meaning to construct the standard deviation cures if the data is not normal distribution model.

2. Need for endemic growth charts

Physical growth depends on both genetic and environmental factors. Environmental factors consist of

nutritional issues and other factors. It is difficult to construct the own growth charts in developing countries because creating the growth charts requires a lot of time, effort, and finance in gathering data. Gathering accurate data requires to get measuring scales and master how to use equipments and statistic technique.

All countries should use the cross-section growth charts for aged from birth to 5 years of age which World Health Organization (WHO) have already developed for developing countries, until the own growth charts developed. Length/height-for-age and weight-for-age growth charts for boy and girl manufacturing by WHO are shown in figure 1 to 4. These cross-section growth charts are for child aged 0 to 5 because of improvement of under 5 year-old mortality rate in some countries, so that WHO does not create the growth charts over 5 years of age. Each country finally should construct the own growth charts from 0 to 18 years of age. If developing countries have own growth charts and revise the basic plan after a period of years, the nationwide growth changes can be estimated estimate the nationwide growth changes.

3. Decision about growth problem

There are two basic different disturbance of growth pattern. First of all, both failure to thrive and obesity at that time is easy to detect by using growth charts or calculating body mass index (body weight (kg) / height $(cm)^2$). Value of weight over 97 percentile and less than 3 percentile are defined as obesity or failure to thrive, respectively. Value of length/height is defined in a similar way. Second, if the growth curve passes upward or downward across the channel, this growth pattern is recognized as growth disorder.

4. Information from growth charts

There are a lot of discoveries from the information of individual growth charts:

1) to evaluate individual growth characteristics,
2) to observe the changes in nutritional status such as obesity or failure to thrive,
3) to find disturbance of growth in stature including short or high stature, it is important to find children with precocious puberty. The early growth spurt initially can cause tall stature in a child with precocious puberty, but rapid bone maturation can cause linear growth to cease too early and can result in short adult stature.
4) patients and Parents except healthcare provider can understand the meaning of growth curve changes intuitively and growth charts help them to understand.
5) Patients and parents easily understand the growth status expressed as a percentage of the total.

Causes and Prevention of Anemia

1. Cause of anemia in childhood

Iron deficiency is the most frequently observed single nutrition deficiency in the world. The rate of anemic pregnant woman in developing countries and in developed countries is 56% and 18%, respectively. A newly born has insufficient iron storage because of poor iron transfer from anemic mothers. Therefore, high rate of anemia in early childhood is observed in developing countries and iron deficiency is known to be cause of developmental impairment.

Infants get all nutrition including iron from mother's own breast milk during the first 6 months of age. If decrease in the quantity and quality of breast milk, adding other liquids can introduce germs into the baby's system that may lead to diarrhea and other illnesses because of difficulty in getting clean water and artificial milk. Breast milk is not only the best food for babies, but has anti-infective property. Chronic diarrheal syndrome can cause undernutrition, furthermore, infants sometimes die as a result of diarrhea in developing countries. Infection by a parasite can be an important cause of chronic diarrhea in developing countries.

2. Action and prevention of anemia

The recommendation from WHO and UNICEF (United Nations Children's Fund) is that infants should be exclusively breast fed, meaning without even water until six months of age. The mother should continue to try to give infant breast milk for up to 24 months, while appropriate supplemental food including weaning food is given after 6 months of age. The breast milk during the first 6 months is rich in baby's need for water and nutritive substance including carbohydrates, proteins, vitamins, other nutritional elements and anti-bodies. Mother's milk is the best to nourish a small baby. Breast milk helps your baby's brain grow and is easy and complete to digest compared with other animal milk and alternative nutrition. WHO says getting new mothers to breast-feed their infants could save 1.3 million children's lives each year. For example, iron concentration in the breast milk is lower than that in the formula milk, however, 20% of iron absorbed from breast milk compared with 7% of Iron absorbed from artificial milk results in a compensatory increase in absorbing more iron from breast milk.

Recent studies revealed that delayed cord clamping at least 60 seconds, if possible, more than 120 seconds increases in blood volume and initial hematocrit at birth. Benefits for term infants by delayed clamping for at least 2 minutes over age 2 to 6 months are improved hematocrit, stored iron, ferritin concentration, and reduction in the risk of anemia.

Nutritional education is essential and basic approach to lead people in developing countries to an appropriate pattern of eating behavior. If these countries get financial support, government or local

community provide iron supplement for high risk groups.

Case Study

Case 1　Growth chart of nutritional disorder (figure 5)

Short stature is observed value of height increase along with –SD curve without crossing channel. On the other hand, weight curve in infants across the -2SD curve. Infants could not get enough energy compatible with age.

Case 2　Growth chart of growth hormone deficiency (figure 6)

An infant was well grown in childhood. Height growth velocity decreased after 3 years of age; however, weight velocity for height was appropriate.

Body mass index was normal in this case, thus we should mark on growth chart with a dot not to miss the fact.

【Figure Legends】

Figure 1.　Length/height-for-age for boys

Figure 2. Weight-for-age for boys

Figure 3.　Length/height-for-age for girls

Figure 4.　Weight-for-age for boys

Figure 5.　Case 1

Figure 6.　Case 2

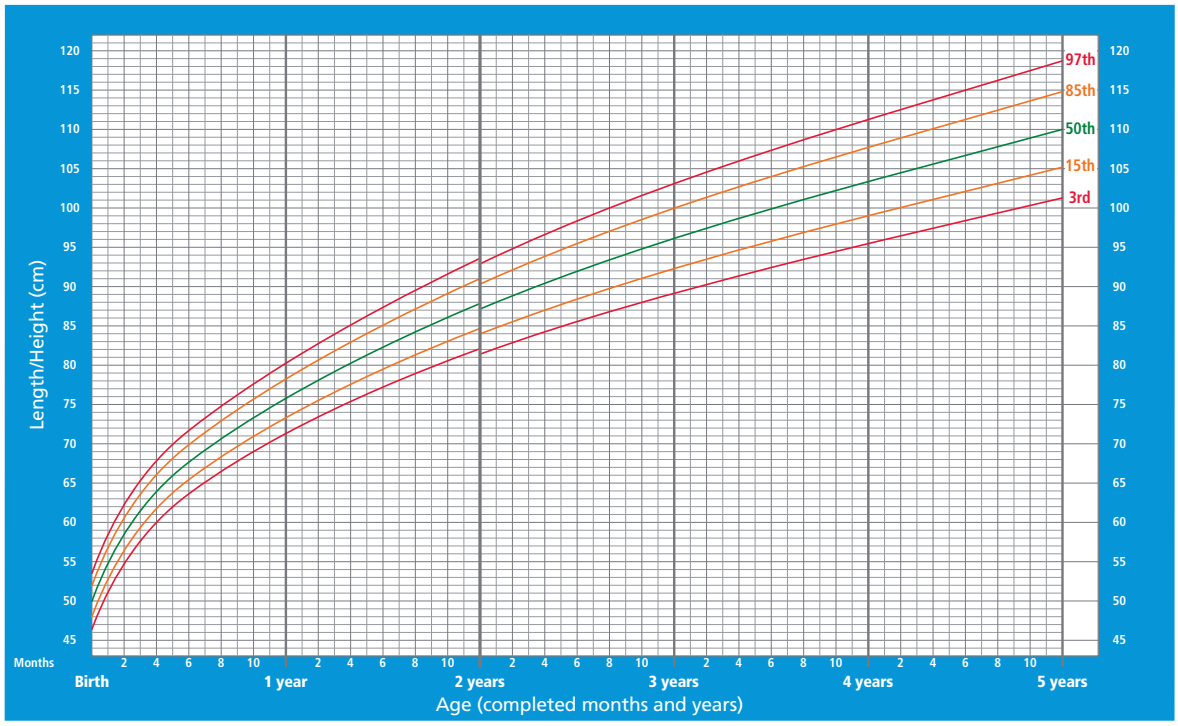
Figure 1 to 4　are referred from the WHO Child Growth Standard from

(http://www.who.int/childgrowth/standards/en/) (October 26. 2009 current)

Length/height-for-age BOYS

Birth to 5 years (percentiles)

World Health Organization

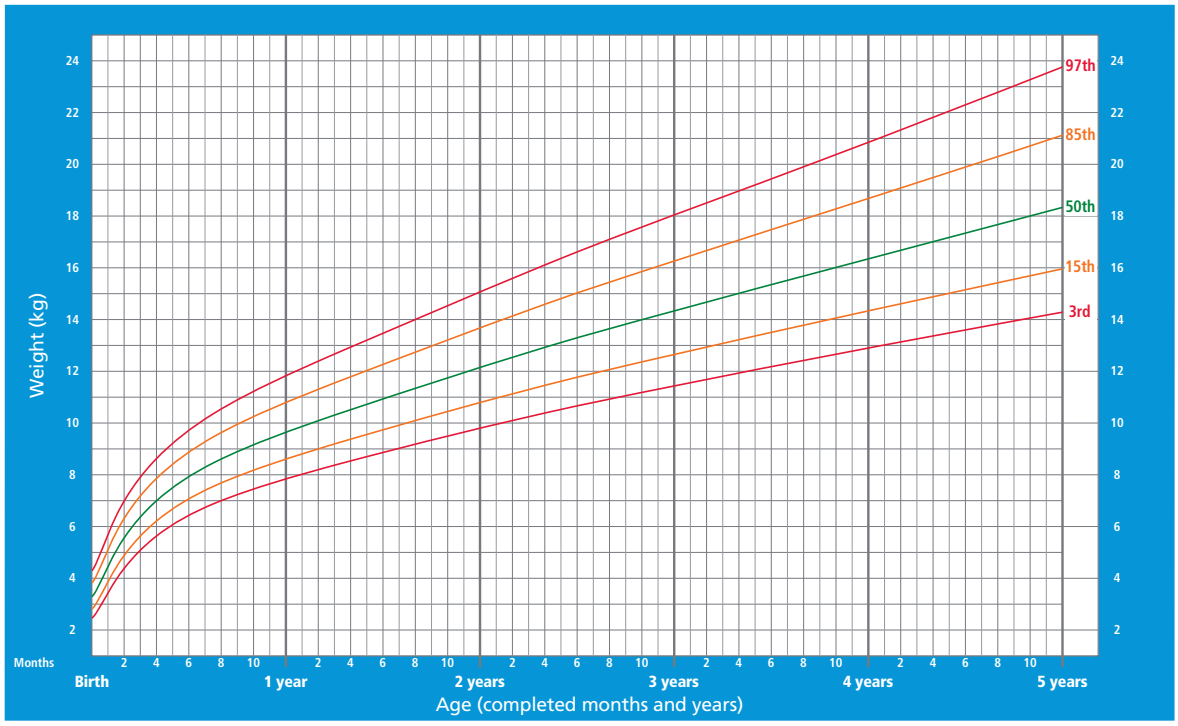


WHO Child Growth Standards

Weight-for-age BOYS

Birth to 5 years (percentiles)

World Health Organization

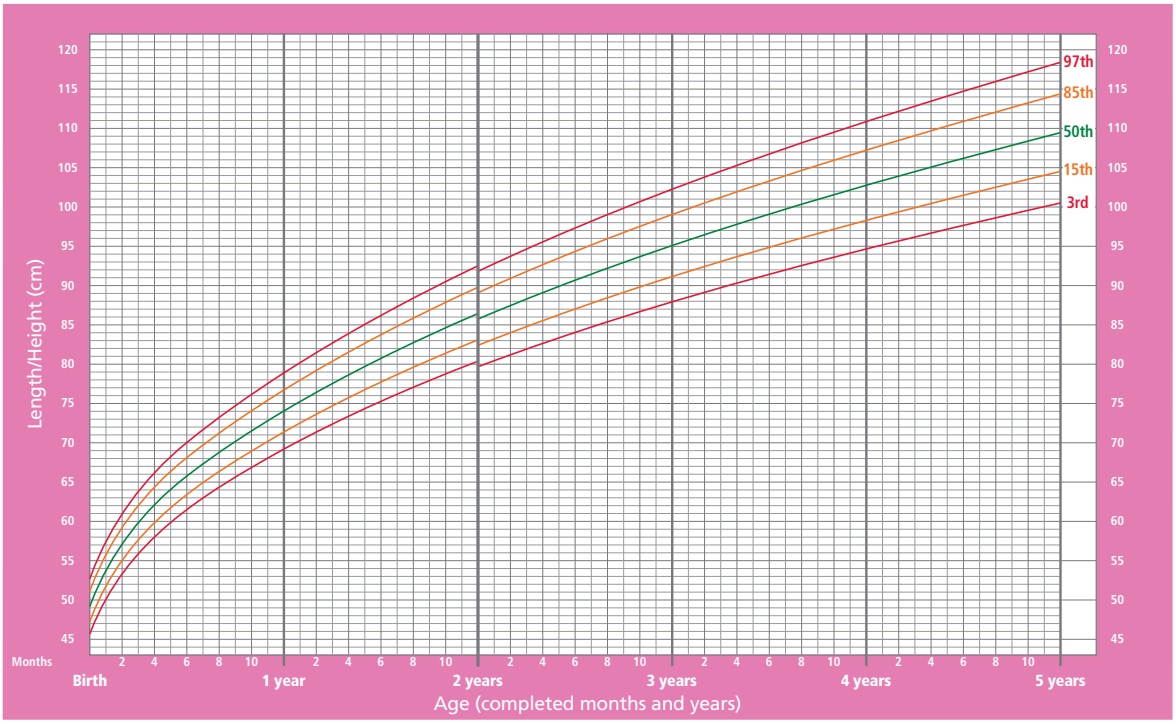


WHO Child Growth Standards

Length/height-for-age GIRLS

Birth to 5 years (percentiles)

World Health Organization

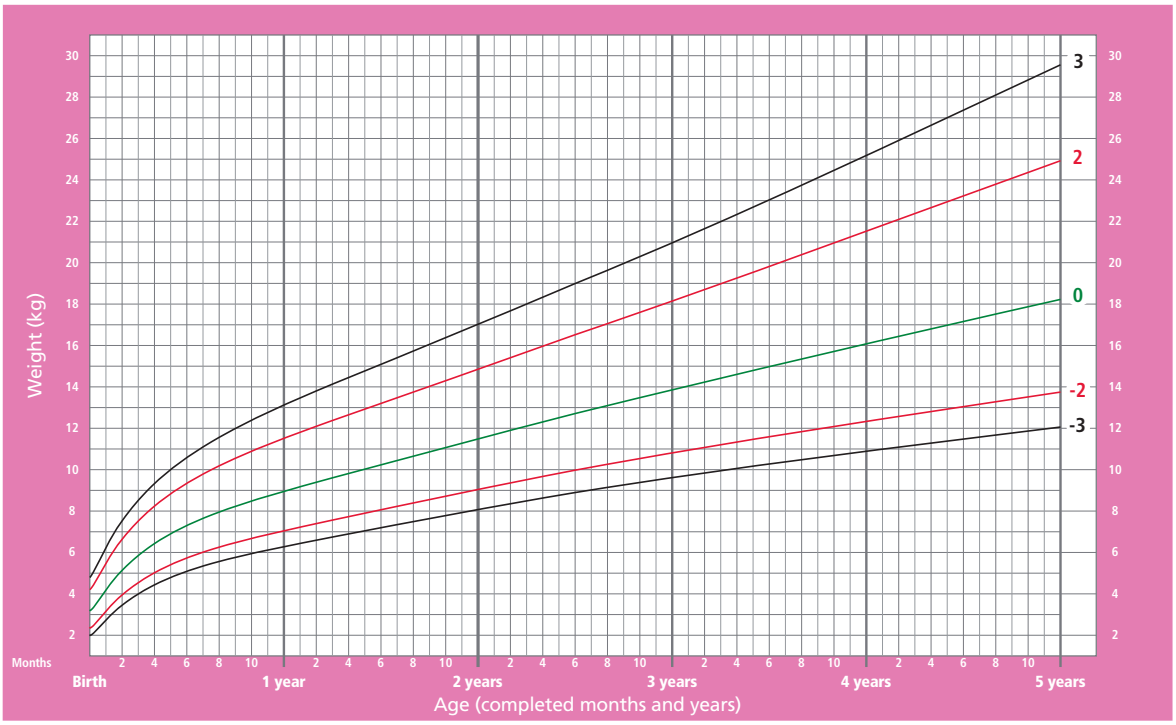


WHO Child Growth Standards

Weight-for-age GIRLS

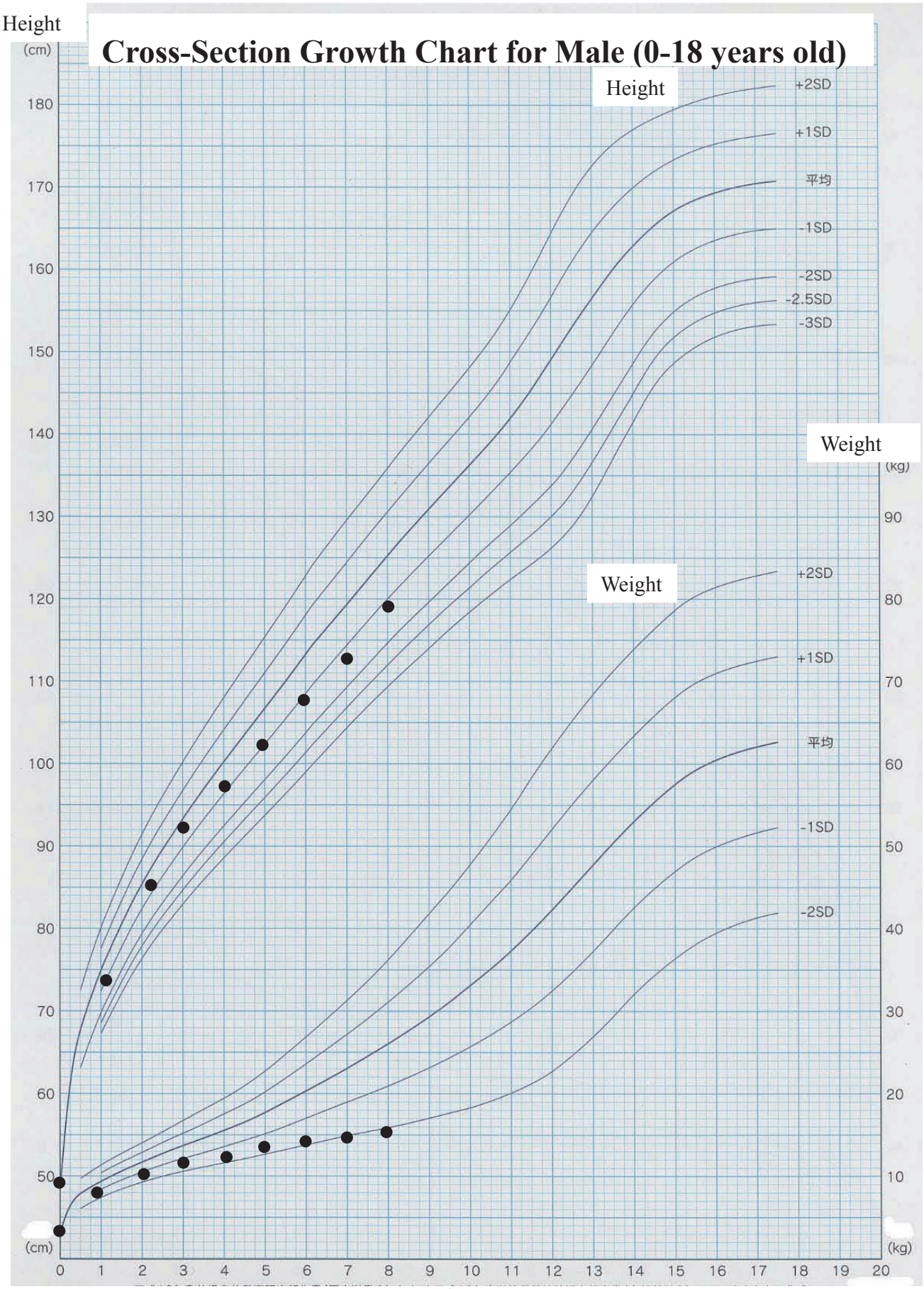
Birth to 5 years (z-scores)

World Health Organization



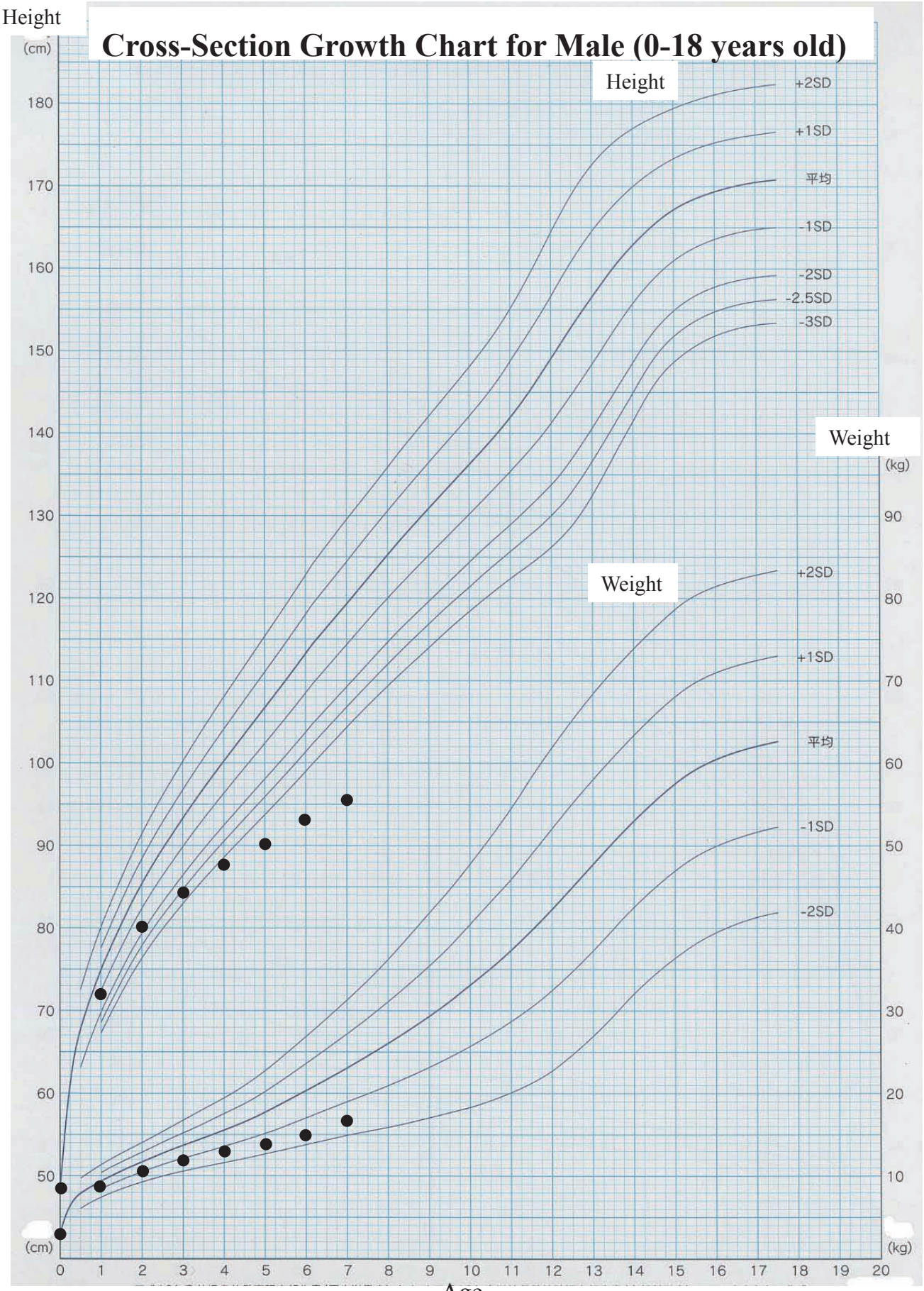
WHO Child Growth Standards

Height


Cross-Section Growth Chart for Male (0-18 years old)
Height
(cm)
180
170
160
150
140
130
120
110
100
90
80
70
60
50
+2SD
+1SD
平均
-1SD
-2SD
-2.5SD
-3SD
Weight
(kg)
90
80
70
60
50
40
30
20
10
Weight
+2SD
+1SD
平均
-1SD
-2SD
(cm)
(kg)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Age

Height

Cross-Section Growth Chart for Male (0-18 years old)



Mother and Child's Health 4

MASAMI MAKIMOTO[1)] and HIDEO MUGISHIMA[2)]
Assistant Professor[1)] and Professor[2)], Department of Pediatrics and Child Health, Nihon University School of Medicine

Introduction

Applications of knowledge from the biomedical research and the improved public health have resulted in dramatic improvements in the newborn infants' health during the 20th century. Advance in perinatal care have led to the survival of growing numbers of children born at the lower limits of viability.

Very low birth weight children have poor outcomes compared to full-term normal birth weight children. Poor outcomes are observed in neurological and health status, cognitive-neuropsychological skills, school performance, academic achievement, and behavior. Outcomes are highly variable and are related to medical risk factors, neonatal medical complications of prematurity, and social risk factors.

Attention is increasingly given to long-term outcomes as the indicators of individual infant's medical and social risk factors as well as the quality of the medical care which the infant receives. Systematic evaluation of risk factors and care practices may identify strategies and interventions. It is necessary to achieve further improvements in the outcome of childbirth at the limits of viability.

Infant, Neonatal, and Postnatal Mortality

In the United States, the IMR (infant death per 1,000 live births) decreased when the percentage of LBW (low birth weight) delivery decreased and birth weight-specific mortality rates were also decreased (figure 1). The percentage of LBW births stabilized in early 1980s, and it remains unchanged until the year 2000. Thus, all of the declines in the IMR since 1980 have been attributed to declines of birth weight-specific IMRs, but not to a reduction of LBW. These declines primarily have attributed to improvement of obstetric and neonatal care. The United States has been unsuccessful in reducing the number of preterm births and LBW deliveries in recent years. Although prevention efforts have the potential to save many infant lives and reduce subsequent morbidity than adding improvements in neonatal care.

Comparison between early neonatal, neonatal, and infant mortality rates in selected countries in the year 2000 is shown in figure 2. Japan has the lowest rates of the early neonatal, neonatal, and infant mortality's

index in the world.
Current neonatal mortality and live birth rate indicate that the infant weight under 1,000 grams are observed in Japan. In 1980, neonatal mortality was 4.9 percent and it declined to 1.5 percent in 2003. In live birth rate, infant's weight under 1,000 grams gradually rose up to 0.3 percent in 2003.

In Japan, child's weight under 2,500 grams of live births are observed. The birth rate of the low birth weight infants decreased once in 1980, but increased again afterwards. A tendency to increase by this time on birth weight under 1,500 grams year by year after 1980 is noticed.
Changes of current maternal mortality rate should also be noticed. In 1979, maternal mortality rate was 22 per 100,000 births. But it was gradually decreased to 4.9 per 100,000 births by now.

The Epoch of Neonatal Medicine in Japan (table 1)

In 1960, the first premature baby rooms were set up in Japan. There were several introductions of neonatal medicines such as: phototherapy and exchange transfusion therapy for neonatal jaundice (1968), continuous positive airway pressure (1971), mechanical ventilation (1974), and high-frequency oscillatory ventilation (1986). The most important therapy for the premature infants was the establishement of surfactant replacement therapy to children with RDS. The surfactant replacement therapy was in the exactly the same epoch. After the inducement of this therapy, the mortality of premature infants had immediately decreased.
Inducement of neonatal medicine continued: the indomethacin therapy for PDA (patent ductus arteriosus) took place (1994), the erythropoietin for anemia of prematurity infant (1995), and nitric oxygen (NO) inhalation therapy for the persistent pulmonary hypertension of the newborn (2001).

The Network of the Perinatal Medicine in Tokyo (1st April, 2008)

This program was introduced for the first time in 1999, since then it was spread to the several areas of Japan.
In Tokyo (figure 3), there are 9 general perinatal centers, and 13 local perinatal centers as well. Tokyo is efficiently divided into eight blocks, and each one has a center and a general perinatal center. However, Itabashi-ku is an exception with two general perinatal centers. These 22 institutions perform the neonatal third degree first aid correspondence with preparations for 24 hours with high quality medicine.

History of the NICU in Nihon University School of Medicine

Although, there is a presentation of the Japanese therapeutic epoch of neonatal medicine on table1 for the induction of the medical equipment and the pharmacotherapy were showed with the comments (figure 4). Birth weight distribution and infant mortality rate in NICU can be seen figure 5, expressing a change of the ratio between each birth weight group and the morality rate accounted during 5 years. It was five years late for this hospital to occur changes of the neonatal birth. The low birth weight infant rates decreased once from 1986 until 1990, but the percentage of the birth weight under 1,500 grams rate had gradually increased a year after 1985.

The current causes of deaths in very low birth weight infants before 1986 were shown in figure 6. Most of the causes of deaths were related to RDS. But when the surfactant replacement therapy had started from 1986 on, the causes of deaths had disappeared and presented at the sepsis, CLD, hypoplastic lungs and intestinal perforation.

That is why these smaller and lighter infants have these diseases frequently. In these current causes of deaths in infants with over 2,500 grams birth weight, the asphyxia was frequently occurred in about 25 percent. Before the year 2000, there were deaths by congenital heart diseases. In current situation, there are patients with 40 percent congenital anomalies are observed. This is the cause of the transportation to other hospitals for operation, and remained in the non-therapouted patients. This is the most important current problem, and these cases remain admitted in Japanese NICU.

Maternal and Child Health

The future preventive pediatrics will include new immunizations to prevent infections, improved screening tests to provide early diagnosis of disease, unique genetic information to individualize preventive and therapeutic strategies, and enhanced treatments that minimize the impact of chronic conditions on the children's health. The major causes of morbidity and mortality in children, however, will continue to be related to human behavior, the society, and the environment. The challenge for pediatricians in practicing preventive pediatrics is to address these threats to the health of children with new approaches to preventive pediatrics.

Supervision of children's health is a unique access point to provide guidance and improve the health status of the entire family. Studies have shown the health status of parents, for example, maternal depression, has significant influences on adequacy of preventive health care service for children. There are also evidences about significant health needs, which are receptive to the pediatricians' acts in screening and referral for comprehensive health supervision. This role of pediatricians influences on the families' health. It is consistent with enhanced supervision guidelines and is also a natural link to improve the children's health.

The Book for Maternal and Child Health care in Japan

When pregnancy is confirmed for the mothers, one should report the pregnancy to the nearest health center. A maternal nursing and child health care handbook is given. The birth certificate and, the book for maternal and child health in Japan are shown in figure 7. Japanese parents take this paper to the nearest government office, file for the family register, and apply for the infant medical care ticket. When a baby is a premature, the nurture medical care ticket will be applied by pediatricians. The intensive premature infant medical care was created with public fund by this nurture medical care.

The History of the Maternal and Child Health Handbook in Japan

In Japan, the Ministry of Health and Welfare was established as the organization which controlled the administration of the country about social welfare, social security and the sanitary improvement and progress in 1938. On 13th of July in 1942, "handbook of rules for expectant women and nursing mothers" was issued by the 35th public welfare departmental order.

When this rule was promulgated, the public welfare, the domestic affairs of states, agriculture and forestry, each business and industry vice-minister gave a joint notice to each prefectural governor. The practical use of this system was established for special distribution of necessities of the expectant women such as rice, mother's nutrient costs, childbirth tools and infant food. The government provided special food for a lot of women. The diffusion rate was remarkable and 70% of all pregnant women performed a pregnant report and underwent the grant of the expectant women and nursing mothers' notebook. The health administration record could be filed out even by a doctor and a nurse midwife, but nowadays these data can be joined by the expectant women as well. The self-care of the physical health was promoted by the grant of the expectant women and nursing mothers' notebook. It returned to the parents' house to keep it for childbirth. When there is a change in medical attendance, information did not break off but the examination results are written in a state of health column. A delivery column is useful for a doctor, the nurse midwife at the next pregnancy as well as the pregnancy by that time. Furthermore, it was based on palpation. It was not only the auscultation but was also expectant women and nursing mothers examination rule in a place of the medical checkup, and urinalysis, blood pressure, health guidance came to be performed by bringing a notebook with themselves.

The Establishment of Maternity Nursing Record Book

Two years after of the World War II, the Child Welfare Law was established as a general fundamental law for a child and its welfare in 1947. This law was established along with the Child Abuse Prevention Law

(1933). Also, the Boy Reformatory Instructor Method Law (the same year) and the Mother and Child Protection Law (1937) were together legislated. The same ideas of upbringing of the child took over the society next era an active improvement of the basic welfare mind. As for the expectant women and nursing mothers notebook established before, an object was pregnant woman. By enactment of a child welfare, the subject of the notebook was expanded to the infants, and the notebook was provided for every child (Geminus, 2). When the expectant woman and nursing mother come to check up with the child, the record of examination is filled. The maternity record book rule based on the Child Welfare Law went under first revision in 1950. The second revision took place for the entire statement of the Children's Charter in a maternity record book in 1953. The third version was performed in the section of the infant growth after in 1956.

The Revision of Maternity Nursing and Child Health Care Record Book

The Maternal and Child Health Law was established in 1966. Approximately, 20 years after the establishment of Child Welfare Law the government described each article of the Law as follow:

Article 1: "The health is maintained so that it determines a principle about the maternal and child health to plan maintenance of motherhood, and infantile health and its increase."

Article 2: "The government protects the mothers and checks her responsibilities which are: taking care of child's health and welfare at the same time."

Article 3: "Hygienic maintenance and development of the infants and children mean that the child's health is maintained to grow up as a mental and body sane together."

In May, 1967, the conventional maternity record book was renamed as "a maternal and child health handbook" with a maternal and child health enactment.

First, pregnant knowledge is stated, then, pregnancy medical check was requested by doctor, nurse, and midwife, a pregnant woman. The mother and child's situation at the time of birth could be described in the contents successively (syphilis and a tuberculosis description pages were deleted and an anamnesis column and the individual examination were added).

A pregnant course column was systematized in this way, and advice in the life pregnancy was described in the margin. Also, the pages of alimentary for gravida were added. In addition, the situation of child periodical growth, description of medical check up, and the vaccination are recorded. The mental and motor function's developmental column has changed from a list to a graph, and a record column of the dental check up was added by a point of view that warned the dental health of both mother and child.

The maternal and child health handbook was entirely revised at the third revision after in 1976. It had

passed through the seventh revision in 1987, and this format is still used today.

Contents in the maternal and child health handbook

There is a lot of information about the maternal nursing and child's health in the maternal and child health handbook.

The following information describes content of the maternal and child health handbook.

1. The local government which published the handbook
2. The address and the occupation of the parents
3. Maternal pregnancy information
4. The way of the pregnant life and dietary intake
5. The intranatal situation (natal place, mode of delivery, height, weight, head circumference, chest measurement, having resuscitation or not) of the baby
6. A situation at the time of the discharge
7. Growth history of the child from the birth to 6 years old
8. Psychogenetic history
9. Vaccination history
10. Normative growth curve
11. Contraction of a disease history
12. Alimentary of babies development
13. Babies care instructions
14. Nearest medical institution and public health service station

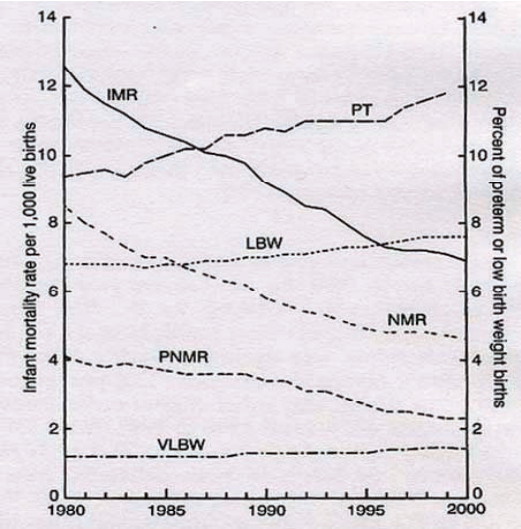
Families always have this handbook. We can share information described in this handbook with the family not to mention doctors, nurses, and midwife.

Conclusion

Maternal and child health care organization management is indispensable to the children's future. The government should prepare for the mothers and families to get the health care and social resources for the maternal child health care.

Then, the government should establish newly mother and child hygiene and the maternal and child health handbook system as well.

Figure 1. Infant, Neonatal, and Postnatal Mortality in United States 1980-2000



- The IMR can decrease when either the percentage of LBW births decreases or birth weight-specific mortality rates decrease.
- The percentage of LBW births plateaued during the early 1980s, and has remained unchanged through 2000.

Donna L.Hoyert et al, pediatrics, 2001

Figure 2. Comparison of Early Neonatal, Neonatal, and Infant Mortality Rate in Selected Countries ,2000

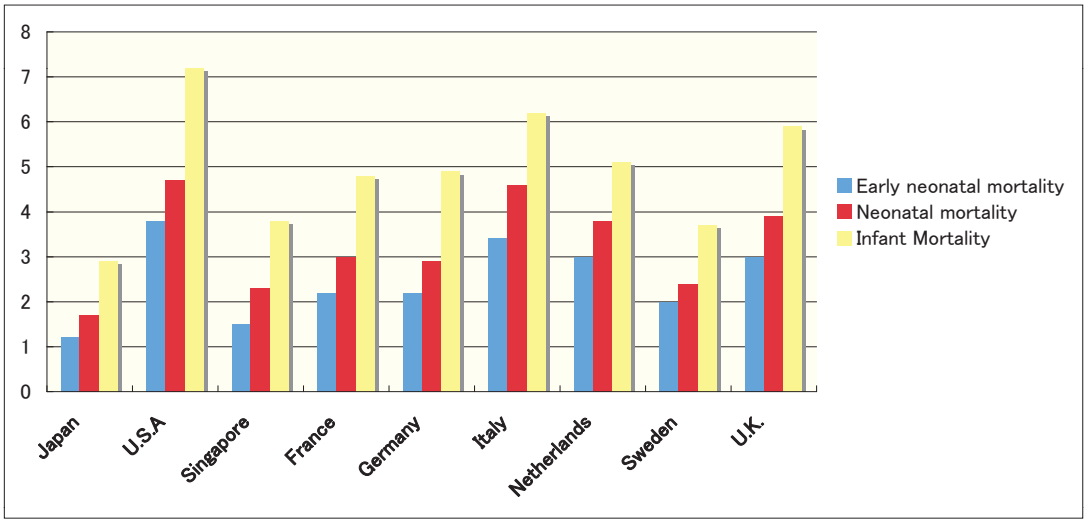


Table 1. The Epoch of Neonatal Medicine in Japan

Year	event
1960	Set up premature baby room
1968	Phototherapy & Exchange Transfusion
1971	Continuous Positive Airway Pressure
1974	Mechanical Ventilation
1986	High Frequency Osillatory Ventilation
1987	Surfactant
1994	Indomethacin
1995	Erythropoietin

Figure 3. Network of the Perinatal Medicine in Tokyo （April.1st. 2008)

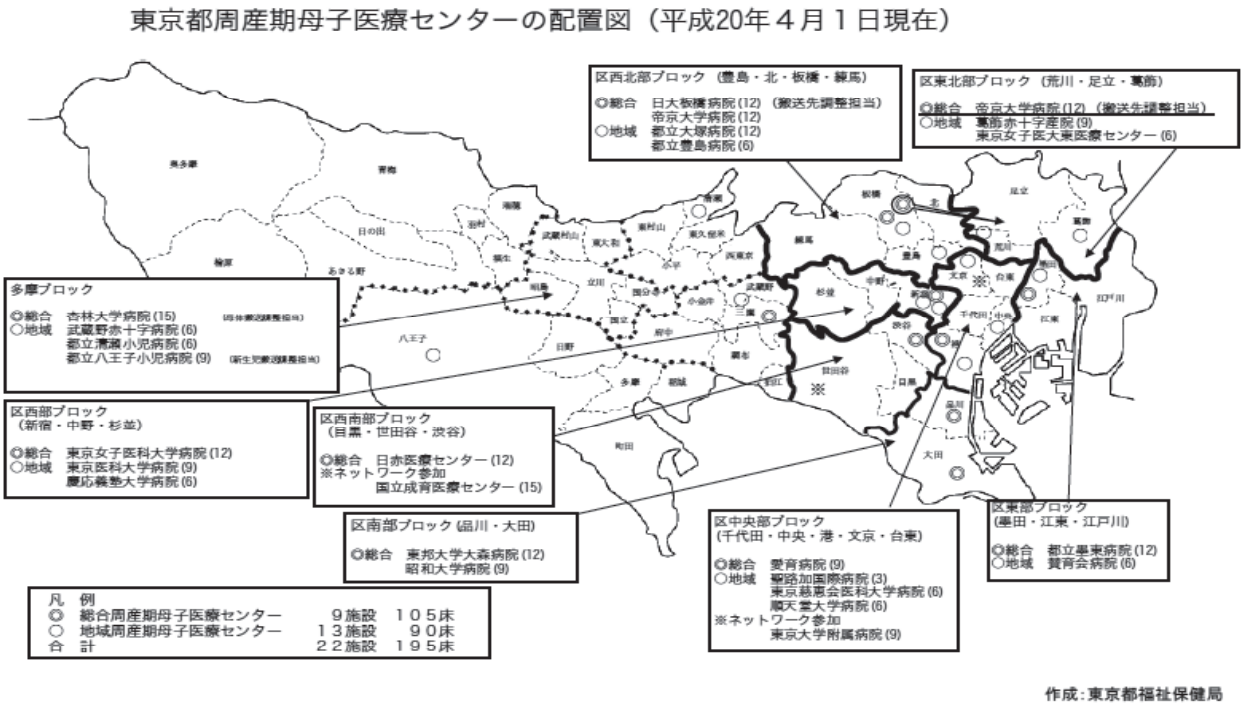


Figure 4. History of perinatal medicine
in Nihon University school of Medicine NICU

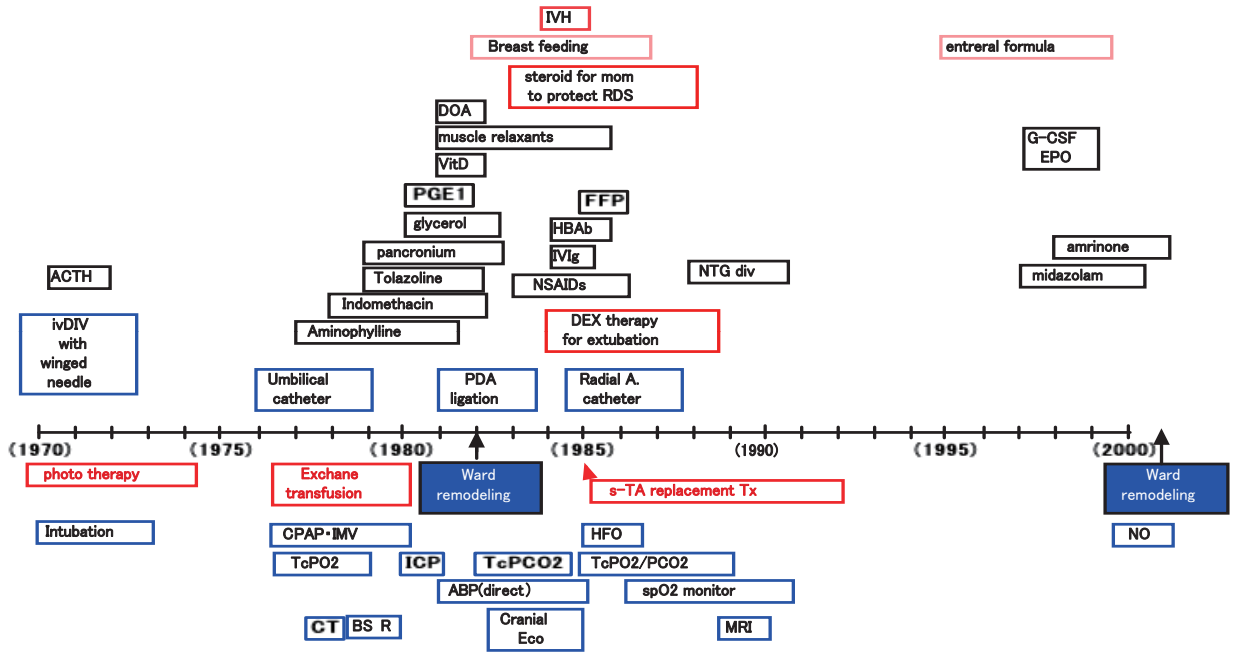


Figure 5. Birth Weight Distribution and
Infant Mortality Rate in NUM NICU

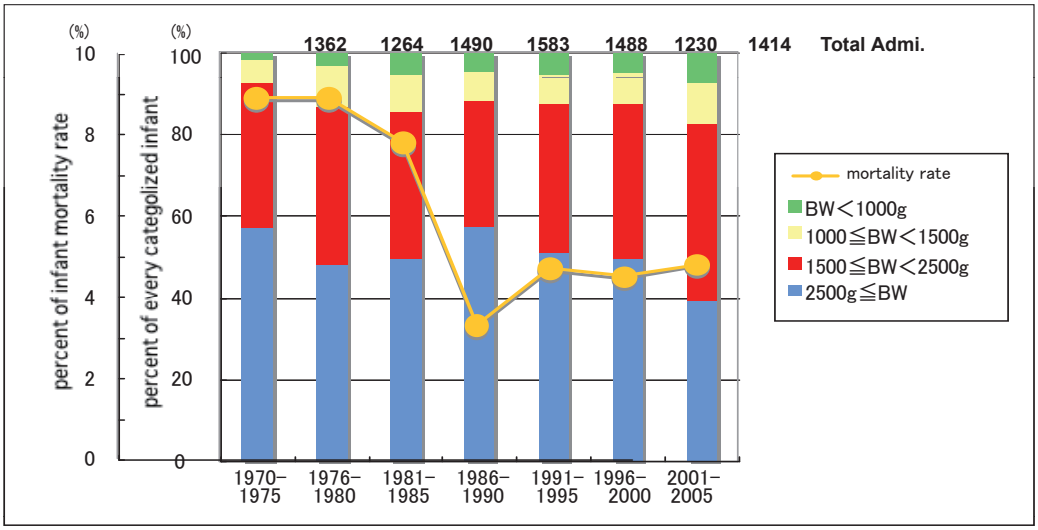


Figure 6. Current Causes of Deaths in Very Low Birth Weight Infants

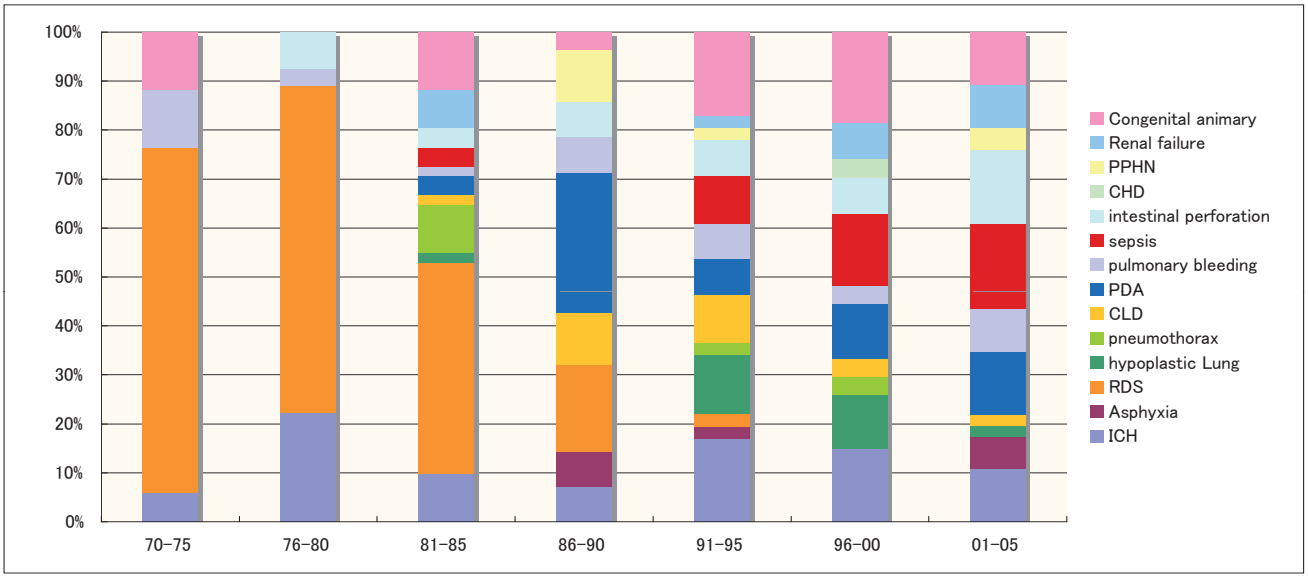
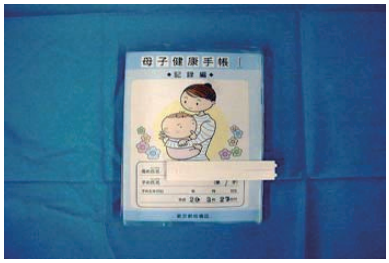
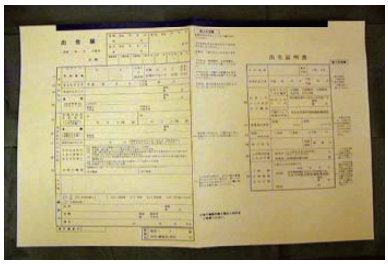


Figure 7. The Birth Certificate and, the book for Maternal and child Health in Japan





A Model of Maternal and Child Health Handbook in Lao

ປຶ້ມຄູ່ມືສຸຂະພາບ ແມ່ແລະລູກ

ຊື່ຜູ້ປົກຄອງ :

ຊື່ລູກ ລູກຜູ້ທີ

ສາລະບານ

1 ສະພາບຂອງສຸຂະພາບຜູ້ຖືພາເປັນຕົ້ນ

○ ໜ້ານີ້ໃຫ້ຜູ້ຖືພາຊຸງນດ້ວຍຕົນເອງ

ລວງສູງ	cm	ນ້ຳໜັກປົກກະຕິ	kg	ອາຍຸແຕ່ງງານ	ປີ

○ ພະຍາດຢູ່ຄ້ຳງລຸ່ມນີ້ ເຄີຍເປັນບໍ ? (ກະລຸນາໝາຍວົງມົນໃສ່ພະຍາດທີ່ເຄີຍເປັນ)
ຄວາມດັນເລືອດສູງ , ໝາກໄຂ່ຫຼັງອັກເສບ , ເບົາຫວານ , ຕັບອັກເສບ , ໂລກຫົວໃຈ , ພະຍາດຕ່ອມໄທຣອຍທ Thyroid , ພະຍາດໜັກອື່ນໆ (ຊື່ພະຍາດ)

○ ພະຍາດຕິດຕ່ໍຢູ່ຄ້ຳງລຸ່ມນີ້ ເຄີຍເປັນບໍ ?

○ ຜ່ານມາເຄີຍຜ່າຕັດບໍ ?
ບໍ່ເຄີຍ ເຄີຍ (ຊື່ພະຍາດ)

○ ຢາທີ່ກຳລັງກິນ (ຢາກິນປະຈຳ)
( )

○ ດູດຢາບໍ ? ບໍ່ດູດ ດູດ (ມື້ລະ ກອກ)
○ ຕີມເຫຼົ້າບໍ ? ບໍ່ຕີມ ຕີມ (ມື້ລະປະມານ)

ສະພາບຂອງສຸຂະພາບຜິວ	ສຸຂະພາບດີ , ບໍ່ດີ (ຊື່ພະຍາດ)

ການຖືພາຜ່ານມາ

ເດືອນປີເກີດ	ສະພາບຖືພາ,ເກີດ,ຫຼັງເກີດ	ນ້ຳໜັກ,ເພດເດັກ	ສະພາບປະຈຸບັນ
_ເດືອນປີ____	ປົກກະຕິ ບໍ່ປົກກະຕິ ປະມານ (ຕ້ຳທ້ອງອາທິດທີ _____, (ເດືອນທີ_____)	_____g ຊາຍ ຍິງ	ສຸຂະພາບດີ, ບໍ່ດີ

2 ວຽກແລະສິ່ງແວດລ້ອມຂອງຜູ້ຖືພາ

○ ໜ້ານີ້ໃຫ້ຜູ້ຖືພາຊຸງນດ້ວຍຕົນເອງ

	ອາຊີບ	(ວຽກປະຈຳ , ອື່ນໆ),ວຽກອ່ວນຕົວ, ເປັນພາ , ອື່ນໆ ບໍ່ມີວຽກ		
	ເນື້ອໃນວຽກ,ສະພາບແວດລ້ອມບ່ອນເຮັດວຽກ			
	ຈຳນວນຊົ່ວໂມງເຮັດວຽກ	ມື້ໜຶ່ງປະມານ ( ) ຊົ່ວໂມງ . ແຕ່ ( )ໂມງ ຫາ ( )ໂມງ		
	ຂີ່ໜ້ຳໄປເຮັດວຽກ			
	ໃຊ້ເວລາເດີນທາງຈ້ຳນານທີ	ບ່ຶ່ງໜຶ່ງ ( ) ນາທີ	ຄວາມແໜ້ນແອອັດ	ແໜ້ນຫຼາຍ,ທ້ຳມະດາ
ຈຸດປ່ຽນແປງຫຼັງຈາກຖືພາ	ໜ້ຳວຽກ ເລລາ (ຖືພາອາທິດທີ___, ເດືອນທີ ___) ປ່ຽນວຽກ ເລລາ (ຖືພາອາທິດທີ___, ເດືອນທີ ___) ອອກວຽກ ເລລາ (ຖືພາອາທິດທີ___, ເດືອນທີ ___) ອື່ນໆ (_____)			
ໜ້ຳວຽກກ່ອນເກີດລູກ	ແຕ່ ວັນທີ___ເດືອນ____, ຈ້ຳນື້_____			
ໜ້ຳວຽກຫຼັງເກີດລູກ	ແຕ່ ວັນທີ___ເດືອນ____, ຈ້ຳນື້_____			

ໜ້ຳວຽກເພື່ອລ້ຽງລູກ (ພໍ່ , ແມ່)	ແຕ່ ວັນທີ___ເດືອນ____ ຫາ ວັນທີ___ເດືອນ____
	ແຕ່ ວັນທີ___ເດືອນ____ ຫາ ວັນທີ___ເດືອນ____

ປະເພດຂອງບ່ອນຢູ່ອາໃສ	ເຮືອນເປັນຫຼັງ (__ຊັ້ນ) , ຄອນໂດມີນ້ຽມ (ອາຄານ___ຊັ້ນ , ຊັ້ນທີ___ , ມີ ລິຟ , ບໍ່ມີ) .. ອື່ນໆ ( )		
ສຽງລົບກວນ	ງຽບ , ທ້ຳມະດາ , ນ້ອຍ	ແສງແດດ	ຖືກແດດດີ , ທ້ຳມະດາ , ບໍ່ມີແດດດີ
ຜູ້ຢູ່ນ້ຳ	ລູກ (__ຄົນ) . ຜົວ . ພໍ່ຜົວ . ແມ່ຜົວ . ພໍ່ . ແມ່ . ອື່ນໆ (__ຄົນ)		

X ກະລຸນາຊຸງນຂໍ້ຄວາມທີ່ເສດກ່ຽວກັບບ່ອນເຮັດວຽກ : ຢືນເຮັດວຽກເປັນສ່ວນຫຼາຍ, ມີອຸນຫະພູມແລະຄວາມຊຸ່ມສູງ, ມີຄວັນກາອກຢາຫຼາຍ, ສັ່ນສະເທືອນຫຼາຍ, ເຄ້ັງຄຽດຫຼາຍ, ພັກຜ່ອນບໍ່ຄ່ອຍໄດ້, ວຽກນອກເວລາຫຼາຍ ເປັນຕົ້ນ

3 ຂັ້ນຕອນການຖືພາ (1)

○ ໜ້ານີ້ ເຖິງແມ່ນວ່າ ທ່ານພໍ່ຮັບຜິດຊອບຈະປ່ງນ ກໍ່ສາມາດເອົາເປັນຂໍ້ມູນອ້າງອີງໄດ້

ມື້ກວດ	ຕັ້ງທ້ອງອາທິດທີ	ສ່ວນສູງຂອງມົດລູກ	ຮອບທ້ອງ	ຄວາມດັນຂອງເລືອດ	ໄຂ່ບວມ	ໂປຣຕີນໃນຍ່ຽວ	ນ້ຳຕານໃນຍ່ຽວ
		cm	cm		− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++

ປະຕິກິລິຍາໂລກ	ເມື່ອວັນທີ____ເດືອນ____ປີ
ກວດພູມຕ້ານຕັບອັກເສບປະເພດ B	ເມື່ອວັນທີ____ເດືອນ____ປີ

ບັນທຶກກ່ຽວກັບຜູ້ຖືພາເອງ

ມື້ເລີ່ມມີປະຈຳເດືອນເທື່ອສຸດທ້າຍ	ວັນທີ____ເດືອນ____ປີ___
ມື້ທຳອິດທີ່ກວດການຕັ້ງທ້ອງນີ້	ວັນທີ____ເດືອນ____ປີ___
ມື້ທີ່ຮູ້ສຶກວ່າເດັກໃນທ້ອງເໜັງຕີງ	ວັນທີ____ເດືອນ____ປີ___
ມື້ກຳນົດເກີດລູກ	ວັນທີ____ເດືອນ____ປີ___

ສະນັ້ນເວລາໄປກວດທ້ອງທຸກເທື່ອຄວນເອົາປຶ້ມຄູ່ມືນີ້ໄປນຳ ○

ໂດຍສະເພາະການກວດອື່ນໆ (ຮ່ວມທັງເມັດເລືອດແດງ)	ນ້ຳໜັກ	ຂໍ້ຄວາມທີ່ຊີ້ນຳພິເສດ(ນອນພັກ,ຢຸດງານ, ຄຳແນະນຳຮັກສາສຸຂະພາບແມ່, ວິທີປະຕິບັດທີ່ຖືກຂຽນໃສ່ບັດຕິດຕໍ່ແລະອື່ນໆ)	ຊື່ໂຮງໝໍຫຼື ຊື່ທ່ານໝໍ
	kg		

ກວດກຸ່ມເລືອດ	ກວດໃນ ວັນທີ____ເດືອນ____ປີ ___	ABO	Rh

ກະລຸນາຂຽນຄວາມຮູ້ສຶກໃນນາມພໍ່ແມ່ທີ່ຈະໄດ້ລູກ ຫຼື ຂຽນເລື່ອງທີ່ເປັນຫ່ວງຫຼືຢາກຂໍຄຳປຶກສາ .

ຖ້າມີເລືອດ . ມີນ້ຳແຕກ . ໜ້າທ້ອງເຂັ່ງແລະເຈັບແລ້ວ ກະລຸນາໄປກວດທັນທີ .

ຂັ້ນຕອນການຖືພາ (2)

○ ໜ້ານີ້ ເຖິງແມ່ນວ່າ ທ່ານພໍ່ຮັບຜິດຊອບຈະປ່ງນ ກໍ່ສາມາດເອົາເປັນຂໍ້ມູນອ້າງອີງໄດ້

ມື້ກວດ	ຕັ້ງທ້ອງອາທິດທີ	ສ່ວນສູງຂອງມົດລູກ	ຮອບທ້ອງ	ຄວາມດັນຂອງເລືອດ	ໄຂ່ບວມ	ໂປຣຕີນໃນຍ່ຽວ	ນ້ຳຕານໃນຍ່ຽວ
		cm	cm		− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++
					− + ++	− + ++	− + ++

ບັນທຶກກ່ຽວກັບຜູ້ຖືພາເອງ

ທີ່ຢູ່ກ່ອນແລະຫຼັງເກີດລູກ	ເບີໂທ
ບ່ອນຕິດຕໍ່ກ່ອນແລະຫຼັງເກີດລູກ (ຜູ້ທີ່ຢາກແຈ້ງໃຫ້ຮູ້)	ເບີໂທ
ວິທີເດີນທາງໄປເຂົ້າໂຮງໝໍ	ລົດສ່ວນຕົວ , ລົດແທັກຊີ່ , ຍ່າງໄປ , ອື່ນໆ( ) ໃຊ້ເວລາເດີນທາງ (____ຊົ່ວໂມງ ____ນາທີ)

ສະນັ້ນເວລາໄປກວດທ້ອງທຸກເທື່ອຄວນເອົາປຶ້ມຄູ່ມືນີ້ໄປນຳ ○

ໂດຍສະເພາະການກວດອື່ນໆ (ຮ່ວມທັງເມັດເລືອດແດງ)	ນ້ຳໜັກ	ຂໍ້ຄວາມທີ່ຊີ້ນຳພິເສດ(ນອນພັກ,ຢຸດງານ, ຄຳແນະນຳຮັກສາສຸຂະພາບແມ່, ວິທີປະຕິບັດທີ່ຖືກຂຽນໃສ່ບັດຕິດຕໍ່ແລະອື່ນໆ)	ຊື່ໂຮງໝໍຫຼື ຊື່ທ່ານໝໍ
	kg		

ກະລຸນາຂຽນຄວາມຮູ້ສຶກໃນນາມພໍ່ແມ່ທີ່ຈະໄດ້ລູກ ຫຼື ຂຽນເລື່ອງທີ່ເປັນຫ່ວງຫຼືຢາກຂໍຄຳປຶກສາ .

ຖ້າມີເລືອດ . ມີນ້ຳແຕກ . ໜ້າທ້ອງເຂັ່ງແລະເຈັບແລ້ວ ກະລຸນາໄປກວດທັນທີ .

4 ສະພາບການເກີດ

○ ໜ້ານີ້ ຄວນບັນທຶກໄວ້ໄວໆຫຼັງຈາກເກີດລູກແລ້ວ

ໄລຍະການຖືພາ	ຖືພາໄດ້ ອາທິດ		
ວັນເວລາເກີດລູກ	ໃນ ວັນທີ___ເດືອນ___ປີ ____ເຊົ້າ ____ໂມງ ____ນາທີ ບ່າຍ		
ຂັ້ນຕອນການເກີດລູກ (ສະພາບຂອງແມ່ແລະເດັກ)	ຕຳແໜ່ງຫົວ ຕຳແໜ່ງສະໂພກ ອື່ນໆ( ) ຂໍ້ຄວາມທີ່ຄວນຂຽນພິເສດ		
ເວລາທີ່ໃຊ້ໃນການເກີດລູກ		ປະລິມານເລືອດທີ່ອອກ	ໜ້ອຍ ປານກາງ ຫຼາຍ(ml)
ສະພາບຂອງເດັກເວລາເກີດ — ເພດ . ຈຳນວນ	ຊາຍ . ຍິງ . ບໍ່ແຈ້ງ : ດ່ຽວ . ຫຼາຍຄົນ (ຄົນ)		
ສະພາບຂອງເດັກເວລາເກີດ — ຕົວເລກວັດເດັກ	ນ້ຳໜັກ __________g	ລວງສູງ _____._____cm	
	ຮອບເອິກ _____._____cm	ຮອບຫົວ _____._____cm	
ສະພາບຂອງເດັກເວລາເກີດ — ຄວາມເຫັນການປະຕິບັດພິເສດ	ເດັກເກີດມາຫົວໃຈຢຸດຊົ່ວຄາວ → (ຕາຍ . ຟື້ນຄືນ) . ຕາຍແຕ່ກຳເນີດ		
ຢັ້ງຢືນ	ໃບຢັ້ງຢືນການເກີດ . ໃບຢັ້ງຢືນການຕາຍ (ໃບຢັ້ງການຕາຍແຕ່ກຳເນີດ) . ໃບຢັ້ງຢືນການເກີດແລະໃບຢັ້ງຢືນການຕາຍ		
ບ່ອນເກີດລູກ ຊື່			
ຊື່ແພດຜູ້ຊ່ອຍການເກີດລູກ	ຊື່ນາຍແພດ :		ອື່ນໆ
	ຊື່ນາງປະດຸງຄັນ		

ຂັ້ນຕອນການຟື້ນຟູສຸຂະພາບຂອງແມ່ຫຼັງເກີດລູກ

○ ກະລຸນາຂໍໃຫ້ທ່ານໝໍບັນທຶກໃຫ້ເວລາກວດຫຼັງເກີດລູກ

ຫຼັງເກີດ ມື້ເດືອນປີ	ການຟື້ນຟູມົດລູກ	ລົງເລືອກ	ສະພາບເຕົ້ານົມ	ຄວາມດັນຂອງເລືອດ	ໄປລຕີນໃນຍ່ຽວ	ນ້ຳຕານໃນຍ່ຽວ	ນ້ຳໜັກ	ໝາຍເຫດ
	ດີ . ບໍ່ດີ	ປົກກະຕິ. ບໍ່ປົກກະຕິ		/	- + ++	- + ++	kg	
	ດີ . ບໍ່ດີ	ປົກກະຕິ. ບໍ່ປົກກະຕິ		/	- + ++	- + ++		
	ດີ . ບໍ່ດີ	ປົກກະຕິ. ບໍ່ປົກກະຕິ		/	- + ++	- + ++		
	ດີ . ບໍ່ດີ	ປົກກະຕິ. ບໍ່ປົກກະຕິ		/	- + ++	- + ++		

ການບັນທຶກຂອງແມ່ເອງ

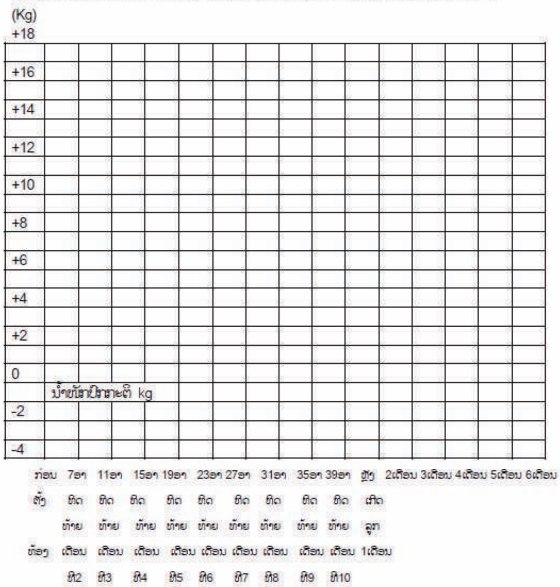
○ ມີຄວາມຮູ້ສຶກເສົ້າໂສກ , ນ້ຳຕາອອກງ່າຍ , ບໍ່ມີໃຈຢາກເຮັດຫຍັງ ບໍ່ ? ບໍ່ມີ ມີ ບໍ່ຊ່າງຊິວ່າ

○ ຫຼັງເກີດລູກ ຖ້າມີຄວາມສົງໄສໃນເລື່ອງໃດຫຼືມີອັນໃດປ່ຽນແປງ ຄວນປຶກສາຫາລືນຳນາຍແພດຫຼືນາງປະດຸງຄັນ ແລະກະລຸນາບັນທຶກໄວ້ດ້ວຍ .

ອາບນ້ຳ	ຫຼັງເກີດລູກ ______ ມື້ (ວັນທີ ___ເດືອນ___)	ເລີ່ມເຮັດວຽກ	ຫຼັງເກີດລູກ ______ ມື້ (ວັນທີ ___ເດືອນ___)
ເລີ່ມກັບໄປເຮັດວຽກ	ຫຼັງເກີດລູກ ______ ມື້ (ວັນທີ ___ເດືອນ___)	ເລີ່ມມີປະຈຳເດືອນ	ຫຼັງເກີດລູກ ______ ມື້ (ວັນທີ ___ເດືອນ___)
ແນະນຳໂຄງການລູກຫ່າງ	ມີ. ບໍ່ມີ (ແພດ. ຜູ້ແນະນຳແຜນຕັ້ງທ້ອງ. ນາງປະດຸງຄັນ) ວັນທີ__ເດືອນ__ປີ___		

5 ບັນທຶກການປ່ຽນແປງຂອງນ້ຳໜັກໃນລະຫວ່າງຖືພາແລະຫຼັງເກີດລູກ

○ ນ້ຳໜັກເປັນໂຕຊີ້ບອກສຸກຂະພາບຮ່າງກາຍ. ໂດຍສະເພາະໃນລະຫວ່າງຖືພາແລະຫຼັງເກີດລູກ, ການເພີ່ມຫຼືຫຼຸດນ້ຳນັກອາດເປັນຫຼັກຖານໃນການຄົ້ນພົບຂອງຄວາມຜິດປົກກະຕິໄດ້, ດັ່ງນັ້ນເພື່ອເປັນທີ່ອ້າງອີງຄວນບັນທຶກໄວ້ .



ໃຫ້ເອົານ້ຳໜັກຕອນກ່ອນຕັ້ງທ້ອງຫຼືຕອນຕັ້ງທ້ອງໃໝ່ເປັນ 0 , ຈຶ່ງບັນທຶກການເພີ່ມຫຼືລຸດນ້ຳໜັກຫຼັງຈາກນັ້ນຂຽນເປັນຈຸດໃສ່ເສັ້ນຕັ້ງ . ຫຼັງຈາກເກີດລູກໄດ້ 6 ເດືອນແລ້ວ ກໍຢາກໃຫ້ນ້ຳໜັກເຍັງເຫຼືອເທົ່າກັບນ້ຳໜັກເມື່ອກ່ອນຕັ້ງທ້ອງ

6 ສະພາບຂອງແຂ້ວແມ່ໃນລະຫວ່າງຖືພາແລະຫຼັງຈາກເກີດລູກ

(ຄາງດ້ານເທິງ)

ກວດຄັ້ງແລກ	ວັນ ເດືອນ ປີ
ຖືພາ	ອາທິດ
ແຂ້ວແມງ	ປົວແລ້ວ ເຫຼັ້ມ ຍັງບໍ່ປົວ ເຫຼັ້ມ
ຫີນປູນແຂ້ວ	ບໍ່ມີ ມີ
ໂລກເຫັງແຂ້ວ	ບໍ່ມີ ເນື້ອແຂ້ວອັກເສບ ເຫັງແຂ້ວອັກເສບ
ອື່ນໆ	
ບັນທຶກການຊີ້ນຳ	
ຊື່ບ່ອນກວດຫຼືຊື່ແພດ	

(ຄາງດ້ານລຸ່ມ)

ລະຫັດສະພາບແຂ້ວ : ແຂ້ວທີ່ ຍັງບໍ່ໄດ້ປົວ C

ແຂ້ວທີ່ມີສຸກຂະພາບດີ / ແຂ້ວທີ່ສູນເສຍ △ ແຂ້ວທີ່ປົວແລ້ວ ○

8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	ຖືພາ.ຫຼັງເກີດໄດ້ ອາທິດ	
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	ຫີນປູນແຂ້ວ	ບໍ່ມີ ມີ
																ໂລກເຫັງແຂ້ວ	ບໍ່ມີ ເນື້ອແຂ້ວອັກເສບ ເຫັງແຂ້ວອັກເສບ
ບັນທຶກການຊີ້ນຳ																	
ກວດ ວັນທີ ເດືອນ ປີ								ຊື່ບ່ອນກວດຫຼືຊື່ແພດ									
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	ຖືພາ.ຫຼັງເກີດໄດ້ ອາທິດ	
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	ຫີນປູນແຂ້ວ	ບໍ່ມີ ມີ
																ໂລກເຫັງແຂ້ວ	ບໍ່ມີ ເນື້ອແຂ້ວອັກເສບ ເຫັງແຂ້ວອັກເສບ
ບັນທຶກການຊີ້ນຳ																	
ກວດ ວັນທີ ເດືອນ ປີ								ຊື່ບ່ອນກວດຫຼືຊື່ແພດ									

7 ການບັນທຶກຂອງຜູ້ປົກຄອງ (ແຕ່ເດັກເກີດໃໝ່ຮອດຫາອາຍຸ 4 ອາທິດ)

- ສະພາບຂອງເດັກໃນເວລາເດັກ
  (ເພື່ອເປັນທີ່ລະນຶກແກ່ລູກ ກະລຸນາບັນທຶກໄວ້)

ນ້ຳໜັກ	g	ຄວາມສູງ	cm
ຮອບເອິກ	cm	ຮອບຫົວ	cm

- ທີ່ເອົານົມໃຫ້ລູກກິນນັ້ນ ຫຼັງຈາກລູກເກີດໄດ້_____ຊົ່ວໂມງ .
- ນົມທີ່ເອົາໃຫ້ກິນເວລານັ້ນ ແມ່ນ (ນົມແມ່ ນົມຜຸ່ນ)
- ເດັກໄດ້ຮັບການກວດຄວາມຜິດປົກກະຕິຂອງ ແຕ່ເກີດຫຼືບໍ ? ເຈົ້າ ບໍ່
- ກະລຸນາຂຽນຄວາມຮູ້ສຶກຂອງພໍ່ແລະແມ່ທີ່ໄດ້ລູກໃໝ່ ແລະຖ້າມີຄວາມກັງວົນໃຈຫຼືເລື່ອງທີ່ຢາກປຶກສາ ກະລຸນາຂຽນໄວ້ .

X ຂັ້ນຕອນການເຕີບໂຕຂອງເດັກອ່ອນເກີດໃໝ່ (ຫຼັງເກີດພາຍໃນ 1 ອາທິດ)

ອາຍຸ (ມື້)#	ນ້ຳໜັກ(g)	ກຳລັງໃນການດູດນົມ	ໂລກໃຕເລືອງ	ອື່ນ
		ອ່ອນ / ທຳມະດາ	ບໍ່ມີ / ມີອາການ / ຫຼາຍ	
		ອ່ອນ / ທຳມະດາ	ບໍ່ມີ / ມີອາການ / ຫຼາຍ	

ອາການຜິດປົກກະຕິໃນຕອນເກີດໃໝ່ :
ບໍ່ມີ
ມີ (ສັນການປິ່ນປົວ)

ຫຼັງເກີດລູກມີອາການຜິດປົກກະຕິ :
ບໍ່ມີ
ມີ (ສັນການປິ່ນປົວ)

ບັນທຶກການອອກໂຮງໝໍ (ວັນທີ____ເດືອນ____ປີ_____ຫຼັງເກີດໄດ້_____ມື້)

ນ້ຳໜັກ g	ວິທີປ້ອນລ້ຽງອ່າງການ : ນົມແມ່ / ນົມສັນ / ນົມງົວ
ທ້ອຍທີ່ຕ້ອງສັງເກດຕໍ່ :	
ຊື່ໂຮງໝໍທີ່ລາວຫຼີ້ນປິ່ນປົວ :	ເບີໂທ :

ຍົດບັນທຶກຂັ້ນຕອນການເຕີບໂຕຂອງເດັກອ່ອນເກີດໃໝ່ (ຫຼັງຈາກເກີດໄດ 1 ທາ 4 ອາທິດ)

ອາຍຸ (ມື້)#	ນ້ຳໜັກ(g)	ກຳລັງໃນການດູດນົມ	ວິທີປ້ອນລ້ຽງອ່ງການ	ຊື່ໂຮງໝໍທີ່ລາວຫຼີ້ນປິ່ນປົວ
		ອ່ອນ / ທຳມະດາ	ນົມແມ່ /ນົມສັນ / ນົມງົວ	
		ອ່ອນ / ທຳມະດາ	ນົມແມ່ /ນົມສັນ / ນົມງົວ	

ຄຳແນະນຳ :

ມື້ເກີດຄິດໄລ່ຢັນ 0 (ສູນ) ມື້

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ1ເດືອນ) (ບັນທຶກວັນທີ__ເດືອນ__ປີ____)

ໄດ້ອາຍຸ 1 ເດືອນ ໃນ ວັນທີ ເດືອນ ປີ

- ○ ເວລາເປີ້ຍໃຕ ຫີນມີໜາກີ່ບໍ ? ເຈົ້າ ບໍ່
- ○ ກິນນົມດີບໍ ? ເຈົ້າ ບໍ່
- ○ ເມື່ອໄດ້ຍິນສຽງດັງແຮງໆເຄີຍເຮົາໃຈຢຸດຫີນຢຸດນົມແລະໃຫ້ບໍ ? ເຈົ້າ ບໍ່
- ○ ບ່ອນຕັດໄສ້ດີ ແຫ້ງບໍ ? ເຈົ້າ ບໍ່

(ເວລາຍັງບໍ່ຫີນແຫ້ງ ກະລຸນາໃຫ້ທ່ານໝໍກວດໃຫ້)

- ○ ມີ ຂີ້ຢັນສີຫຼືອງອ່ອນ , ສີຫີນ , ສີຂີ້ເຫົ່າ ຢ່າງຕໍ່ເນື່ອງກັນບໍ່ ?# ເຈົ້າ ບໍ່
- ○ ເຄີຍມີຄວາມຮູ້ສຶກວ່າຄັ່ງລູກຍາກບໍ ? ບໍ່ມີ ມີ ບໍ່ສາມາດເວົ້າໄດ້
- ○ ກະລຸນາຂຽນຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ເຄີຍເປັນ ແລະຄວາມຮູ້ສຶກຢ່າງເສີ .

ໃນຄໍ່ານະນີ້ທີ່ມີຂີ້ຢັນສີຫຼືອງອ່ອນ , ສີຫີນ , ສີຂີ້ເຫົ່າແລະຕາຂາວແລະຜິວໜັງເປັນສີຫຼືອງ ຫຼືສີຂຽວອ່ອນແລ້ວ ຈະສົ່ງໃຫ້ທ່ານໝໍໂຫຍຍາ ດັ່ງນັ້ນຈົ່ງພ້ອມພາລູກໄປກວດປ່ຳທ່ານໝໍເດ້ີ.

ກວດສຸຂະພາບ ຄັ້ງ 1 ເດືອນ

(ກວດໃນ ວັນທີ____ເດືອນ____ປີ_____. ໄດ້____ເດືອນ____ມື້)

ນ້ຳໜັກ	g	ລວງສູງ	g
ຮອບເອິກ	cm	ຮອບຫົວ	cm
ສະພາບອາການປ່ຳລູງ	ດີ . ຕ້ອງຊີ້ນຳ	ວິທີປ່ຳລູງລ້ຽງ	ນົມແມ່ . ນົມສັນ . ນົມຜຸ່ນ
ມີສຸຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ			
ທ້ອຍທີ່ຊີ້ນຳ			
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ			

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທ້ຈາຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ____ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ທ້ອຍທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		g	cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ3-4 ເດືອນ)(ບັນທຶກວັນທີ__ເດືອນ__ປີ___)

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ ___ເດືອນ____ມື້)

- ຄໍແຂງແລ້ວບໍ່ ? ເຈົ້າ ບໍ່
  (ຄໍແຂງເມື່ອປະມານວັນທີ____ເດືອນ___)
- ເມື່ອຍອາຫົວບໍ່? ເຈົ້າ ບໍ່
- ເປັນທີ່ງວ່າແສງຕາແລະການເຄື່ອນໄຫວຂອງຕາບໍ່ຜິດປົກກະຕິບໍ່? ບໍ່ ເຈົ້າ
- ຖ້າເອີ້ນໃສ່ແຕ່ທາງທີ່ແອນ້ອຍບໍ່ເຫັນ,ແອນ້ອຍຈະຫັນໜ້າໄປຫາທາງສຽງເອີ້ນໃສ່ບໍ່? ເຈົ້າ ບໍ່
- ໄດ້ພາອອກໄປຖືກອາກາດທາງນອກບໍ່? ເຈົ້າ ບໍ່
  (ມື້ອາກາດດີ ຄວນນຸ່ງເຄື່ອງບາງໆໃຫ້ແລ້ວພາອອກໄປຍ່າງຫຼິ້ນດ້ວຍ)
- ໃນການລ້ຽງລູກມີຄວາມຮູ້ສຶກຫຍຸ້ງຍາກຫຍັງບໍ່? ບໍ່ມີ ມີ ບໍ່ສາມາດເວົ້າໄດ້
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸຂະພາບ 3 ຫາ 4 ເດືອນ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ ___ເດືອນ____ມື້)

ນ້ຳໜັກ	g	ລວງສູງ	. cm
ຮອບເອິກ	. cm	ຮອບຫົວ	. cm
ສະພາບອາຫານບຳລຸງ	ດີ . ຕ້ອງຊີ້ນຳ	ວິທີບຳລຸງລ້ຽງ	ນົມແມ່ . ປົນກັນ . ນົມຝຸ່ນ
ການຈຳກັດການແບຂອງສະໂພກ	ບໍ່ມີ . ມີ		
ມີສຸຂະພາບເຂັ້ມແຂງ .ຕ້ອງສັງເກດ			
ຫົວຂໍ້ທີ່ຊີ້ນຳ			
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ			

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບເທື່ອຕໍ່ໄປ

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		g	cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 6-7 ເດືອນ)(ບັນທຶກວັນທີ__ເດືອນ__ປີ___)

- ຄວ່ຳໄດ້ແລ້ວບໍ່? ເຈົ້າ ບໍ່
- ນັ່ງແລ້ວບໍ່? (ປະມານ 7 ເດືອນ) ເຈົ້າ ບໍ່
  (ເວລາບໍ່ມີແນວຄ້ຳຫາກນັ່ງໄດ້ : ວັນທີ___ເດືອນ ____)
- ຖ້າມີຂອງຫຼິ້ນຢູ່ໃກ້ໆໂຕ ເດັກໄປຈັບບໍ່? ເຈົ້າ ບໍ່
- ເວລາຢູ່ກັບຄອບຄົວ,ອອກສຽງຄືຍາກລົມນຳບໍ່? ເຈົ້າ ບໍ່
- ຖ້າເປີດສຽງໂທລະທັດຫຼືວິທະຍຸ ຈະຫັນໜ້າໄປທາງສຽງທັນທີບໍ່? ເຈົ້າ ບໍ່
- ເລີ່ມໃຫ້ກິນອາຫານອ່ອນໆແລ້ວບໍ່? ເຈົ້າ ບໍ່
  (ຫຼັງຈາກເລີ່ມກິນອາຫານໄດ້ 1ເດືອນແລ້ວ,ຄວນໃຫ້ກິນມື້ໜຶ່ງ 2ເທື່ອແລະຄ່ອຍໆເພີ່ມຊະນິດຂອງອາຫານຂຶ້ນ . ອາຍຸປະມານ 7-8 ເດືອນໄປໃຫ້ກິນອາຫານອ່ອນຂະໜາດສາມາດໃຊ້ລີ້ນເຮັດໃຫ້ແຫຼກໄດ້)
- ເຫັນແກ່ນຕາເປັນສີຂາວຫຼືເຫຼືອມເປັນສີຂຽວອ່ອນບໍ່? # ບໍ່ ເຈົ້າ
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ເວລາເຫັນແກ່ນຕາເປັນສີຂາວຫຼືເຫຼືອມເປັນສີຂຽວອ່ອນນັ້ນ ຢ້ານມີພະຍາດຕາ . ກະລຸນາພາໄປໃຫ້ທ່ານໝໍປົວຕາກວດເບິ່ງ .

ກວດສຸຂະພາບ 6 ຫາ 7 ເດືອນ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ ___ເດືອນ____ມື້)

ນ້ຳໜັກ	g	ລວງສູງ	cm
ຮອບເອິກ	cm	ຮອບຫົວ	cm
ສະພາບອາຫານບຳລຸງ	ດີ . ຕ້ອງຊີ້ນຳ	ວິທີບຳລຸງລ້ຽງ	ນົມແມ່ . ປົນກັນ . ນົມຝຸ່ນ
ອາຫານອ່ອນ	ເລີ່ມ . ຍັງບໍ່ເລີ່ມ	ແຂ້ວ	ຫຼຸ້ນ
ໃນປາກມີພະຍາດຫຼືມີສິ່ງຜິດປົກກະຕິບໍ່#	ບໍ່ມີ . ມີ ( )		
ມີສຸຂະພາບເຂັ້ມແຂງ .ຕ້ອງສັງເກດ			
ຫົວຂໍ້ທີ່ຊີ້ນຳ			
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ			

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		g	cm		

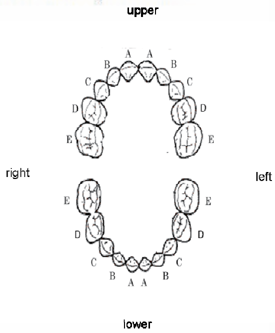
ໃນປາກມີພະຍາດຫຼືມີສິ່ງຜິດປົກກະຕິນັ້ນ ແມ່ນລວມທັງ ແຂ້ວແມງ, ພະຍາດເຫືອກແຂ້ວ, ແຂ້ວເກີງ ແຂ້ວລຸ່ມບໍ່ຖືກກັນ

p 2 2

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ9-10ເດືອນ)(ບັນທຶກວັນທີ__ເດືອນ__ປີ___)

- ຄານໄດ້ແລ້ວບໍ? ແມ່ນ ບໍ່ແມ່ນ
  (ມື້ຄານໄດ້ : ວັນທີ__ເດືອນ__)
- ສາມາດຈັບອັນໃດອັນໜຶ່ງແລ້ວຢືນໄດ້ບໍ່? ແມ່ນ ບໍ່ແມ່ນ
  (ມື້ຄານໄດ້ : ວັນທີ__ເດືອນ__)
- ໃຊ້ນີ້ວມືຈັບຂອງນ້ອຍໆໄດ້ບໍ? ແມ່ນ ບໍ່ແມ່ນ
  (ຄວນລະວັງບໍ່ໃຫ້ມີກອາຍາແລະຜົດໜາກຖົ່ວຕິກເຊ່ຍເພາະຢ້ານລູກຫຼົງກິນ)
- ການໃຫ້ກິນນົມທ່າງໆນັ້ນດຳເນີນໄດ້ດີບໍ? ແມ່ນ ບໍ່ແມ່ນ
  (ຄວນໃຫ້ລູກກິນເຂົ້ານື້ໜຶ່ງ 3ເທື່ອ . ນັບແຕ່ປະມານ 9ເດືອນໄປ ໃຫ້ກິນອາຫານທີ່ອ່ອນຂະໜາດໃຊ້ເຜີນແຂ້ວທຍ້ຳໄດ້)
- ເມື່ອຄ່ອຍໆຍ່າງເຂົ້າໄປໃກ້ໆແລ້ວເອີ້ດ້ວຍສຽງຄ່ອຍໆ ກໍຫັນໜ້າມາຫາບໍ່?
  ແມ່ນ ບໍ່ແມ່ນ
- ຄານຕາມບໍ? ແມ່ນ ບໍ່ແມ່ນ
- ມີຄວາມເປັນຫ່ວງກ່ຽວກັບການເກີດ,ຮູບຮ່າງຂອງແຂ້ວແລະເນື້ອແຂ້ວບໍ?
  ບໍ່ແມ່ນ ແມ່ນ
- ມີຄວາມຮູ້ສຶກຫຍຸ້ງຍາກໃນການລ້ຽງລູກບໍ່? ບໍ່ແມ່ນ ແມ່ນ ບໍ່ສາມາດເວົ້າໄດ້
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ຈົ່ງຂຽນມື້ເດືອນທີ່ແຂ້ວອອກໃສ່ ຮູບຢູ່ຂ້າງຂວານີ້.
(ອາຍຸເດືອນທີ່ແຂ້ວເລີ່ມອອກ __________)
ຖ້າມີແຂ້ວແມງຫຼືແຂ້ວທີ່ຜິດປົກກະຕິ ກະລຸນາໝາຍ x ໃສ່ ຮູບຢູ່ຂ້າງຂວານີ້.



ກວດສຸກຂະພາບ 9 ຫາ 10 ເດືອນ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ ___ເດືອນ____ມື້)

ນ້ຳໜັກ	g	ລວງສູງ	cm
ຮອບເອິກ	cm	ຮອບຫົວ	cm
ສະພາບອາຫານບຳລຸງ	ດີ . ຕ້ອງຊີ້ນຳ	ອາຫານອ່ອນໃນມື້ໜຶ່ງ	ເທື່ອ
ແຂ້ວ	ເຫຼັ້ມ	ໃນປາກມີພະຍາດຫຼືມີສິ່ງຜິດປົກກະຕິບໍ່	ບໍ່ມີ . ມີ ( )
ມີສຸກຂະພາບເຂັ້ມແຂງ .ຕ້ອງສັງເກດ			
ຫົວຂໍ້ທີ່ຊີ້ນຳ			
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ			

ການບັນທຶກຈົນກວ່າການກວດສຸກຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		g	cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 1ປີ) (ບັນທຶກວັນທີ___ເດືອນ___ປີ____)

ອາຍຸໄດ້ 1 ປີ ເມື່ອ ວັນທີ ເດືອນ ປີ

- ສາມາດຈັບທັ້ນຈັບໜີ້ຍ່າງໄປໄດ້ບໍ່? ເຈົ້າ ບໍ່
  (ມື້ຄານໄດ້ : ວັນທີ___ເດືອນ___)
- ສາມາດໃຊ້ທ່າທາງສະແດງສັ່ງລາ ບາຍໆ , ສະບາຍດີໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ຍ້ອນຕາມຈັງວະຂອງສຽງໂທລະທັດຍ່າງມ່ວນຊື່ນຫຼືບໍ່? ເຈົ້າ ບໍ່
- ສາມາດເຂົ້າໃຈຄຳເວົ້າຂອງຜູ້ໃຫຍ່ແບບງ່າຍໆເຊັ່ນ (ມານີ້ , ຂໍແນ່)ບໍ່? ເຈົ້າ ບໍ່
- ຖ້າຫຼີ້ນປາດີໃຈບໍ່? ເຈົ້າ ບໍ່
- ຈັງວະໃນການກິນເຂົ້າມື້ລະ 3ເທື່ອນັ້ນເຮັດໄດ້ປົກກະຕິບໍ່? ເຈົ້າ ບໍ່
  (ເພື່ອບໍ່ໃຫ້ເດັກບໍ່ຢາກກິນເຂົ້າແລະປ້ອງກັນບໍ່ໃຫ້ເປັນແຂ້ວແມງ ຄວນບໍ່ໃຫ້ກິນຂອງກິນທີ່ມີນ້ຳຕານຫຼາຍ)
- ມັກຫຼີ້ນແບບໃດ? (ໂຕຢ່າງການຫຼິ້ນ:)
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸກຂະພາບ 1 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ ___ປີ___ເດືອນ)

ນ້ຳໜັກ	g	ລວງສູງ	. cm
ຮອບເອິກ	. cm	ຮອບຫົວ	. cm
ສະພາບອາຫານບຳລຸງ	ດີ . ຕ້ອງຊີ້ນຳ	ນົມແມ່	ບໍ່ກິນແລ້ວ . ກິນຢູ່
ມື້ໜຶ່ງກິນເຂົ້າ ( )ເທື່ອ , ຂອງຫວ່າງ (ເທື່ອ)		ຕາຜິດປົກກະຕິ(ລະດັບຕາ,ສາຍຕາ,ອື່ນໆ)	ບໍ່ຜິດ . ຜິດປົກກະຕິ . ສົງໃສ( )
ມີສຸກຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ			

ສະພາບແຂ້ວ	E	D	C	B	A	A	B	C	D	E	ແຂ້ວແມງທີ່ຕ້ອງປົວ	ບໍ່ມີ . ມີ (ເຫຼັ້ມ)
											ຄວາມເປື້ອນຂອງແຂ້ວ	ສະອາດ,ທຳມະດາ,ເປື້ອນ
	E	D	C	B	A	A	B	C	D	E	ເຜີນແຂ້ວ.ເນື້ອເຫງືອກ	ບໍ່ຜິດ, ຜິດປົກກະຕິ( )
											ແຂ້ວເທິງແຂ້ວລຸ່ມບໍ່ຖືກກັນ	ບໍ່ມີ, ຄວນລະວັງ
											ກວດໃນ ວັນທີ ເດືອນ ປີ	
ຫົວຂໍ້ທີ່ຊີ້ນຳ												
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ												

ການບັນທຶກຈົນກວ່າການກວດສຸກຂະພາບເທື່ອຕໍ່ໄປ

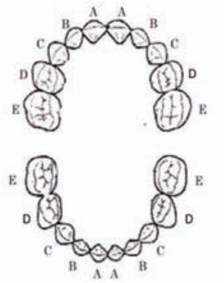
(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		g	cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ1ປີ6ເດືອນ)(ບັນທຶກວັນທີ__ເດືອນ__ປີ___)

ໜ້ານີ້ ຄວນຂຽນໃຫ້ແລ້ວກ່ອນການກວດສຸຂະພາບເດັກນ້ອຍອາຍຸ 1 ປີ 6 ເດືອນ .

- ສາມາດຍ່າງໄດ້ດ້ວຍຕົນເອງເທົ່າງບໍ່? ເຈົ້າ ບໍ່
  (ມື້ທີ່ສາມາດຍ່າງໄດ້ດ້ວຍຕົນເອງ : ປະມານ ປີ ເດືອນ)
- ສາມາດເວົ້າຄຳສັບຈຳນວນໜຶ່ງທີ່ມີຄວາມໝາຍ ເຊັ່ນ ແມ່ , ລົດ ເປັນຕົ້ນ ບໍ່?
  ເຈົ້າ ບໍ່
- ສາມາດຈັບຈອກກິນນ້ຳດ້ວຍຕົນເອງໄດ້ບໍ່? ເຈົ້າ ບໍ່
  (ເພື່ອປ້ອງກັນບໍ່ໃຫ້ເປັນແຂ້ວແມງ ຄວນໃຫ້ເຊົາໃຊ້ເຕົ້ານົມກິນ)
- ເວລາກິນເຂົ້າແລະຂອງຫວານນັ້ນໄດ້ກຳນົດໄວ້ບໍ່? ເຈົ້າ ບໍ່
- ຫຼັງຈາກເດັກນ້ອຍຖູແຂ້ວເອງແລ້ວປົກຄອງຖູແຂ້ວຊ່ອຍເດັກນ້ອຍບໍ່? ເຈົ້າ ບໍ່
- ເປັນຫ່ວງທີ່ເດັກນ້ອຍເຫຼື້ອມຕາຫຼາຍແລະມີການໄຫວຂອງຕາທີ່ຜິດປົກກະຕິບໍ່? #
  ບໍ່ ເຈົ້າ
- ຖ້າຮ້ອງສີ່ຢູ່ທາງຫຼັງ ກໍ່ວ່າຍໜ້າມາເບິ່ງບໍ່? ເຈົ້າ ບໍ່
- ມັກຫຼິ້ນແບບໃດ? (ໂຕຢ່າງການຫຼິ້ນ:)
- ມີຄວາມຮູ້ສຶກຫຍຸ້ງຍາກໃນການລ້ຽງລູກບໍ່? ບໍ່ ເຈົ້າ ບໍ່ສາມາດເວົ້າໄດ້
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ



ຖ້າເປັນແຂ້ວແມງຫຼືແຂ້ວຜິດປົກກະຕິ ກະລຸນາໝາຍ x ໃສ່ຮູບຢູ່ຂ້າງຂວານີ້.

ກວດສຸຂະພາບ 1 ປີ 6 ເດືອນ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ_____. ໄດ້ ___ເດືອນ____ມື້)

ນ້ຳໜັກ	. Kg	ລວງສູງ	. cm		
ຮອບເອິກ	. cm	ຮອບຫົວ.	. cm		
ສະພາບອາຫານບຳລຸງ	ດີ . ຕ້ອງຊີ້ນຳ	ນົມແມ່	ບໍ່ກິນ . ກິນ	ປະນົມ	ເຊົາກິນແລ້ວ, ຍັງບໍ່ທັນເຊົາ
ຕາຜິດປົກກະຕິ(ລະດັບຕາ ,ສາຍຕາ,ອື່ນໆ)	ບໍ່ມີ . ມີ( )	ຫູຜິດປົກກະຕິ (ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ)	ບໍ່ມີ . ມີ . ສົງໃສ ( )		
ສັກວັກແຊງປ້ອງກັນໂລກ (ຂີດວົງມົນໃສ່ທີ່ໄດ້ສັກ)	BCG , Polio , Diphtheria(ໂລກຄໍຕີບ), Whooping cough , Tetanus(ບາດທະຍັກ) ,Measles(ໂລກຫັດ), Rubella(ໂລກຫັດສາມມື້)				
ມີສຸຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ					

ສະພາບແຂ້ວ											
										ແຂ້ວທີ່ເປັນແມງ	O1 O2 A B C
										ແຂ້ວແມງທີ່ຕ້ອງປົວ	ບໍ່ມີ . ມີ (ເຫຼັ້ມ)
	E	D	C	B	A	A	B	C	D	E	ຄວາມເປື້ອນຂອງແຂ້ວ	ງາມ, ທຳມະດາ, ເປື້ອນ
	E	D	C	B	A	A	B	C	D	E	ເຫັນແຂ້ວ.ເຍື່ອເຫງືອກ	ບໍ່ຜິດ, ຜິດປົກກະຕິ( )
										ແຂ້ວເທິງແຂ້ວລຸ່ມບໍ່ຖືກກັນ	ບໍ່ມີ,ຄວນລະວັງ( )
										ກວດໃນ ວັນທີ ເດືອນ ປີ	

ຫົວຂໍ້ທີ່ຊີ້ນຳ	
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ	

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ
		Kg	cm		

ແຂ້ວທີ່ເປັນແມງ O1: ບໍ່ມີແຂ້ວແມງ, ແຂ້ວກໍ່ສະອາດ O2: ບໍ່ມີແຂ້ວແມງ, ແຂ້ວເປື້ອນ

A : ແຂ້ວກົກຫຼືແຂ້ວທາງໜ້າເປັນແຂ້ວແມງ, B : ແຂ້ວກົກແລະແຂ້ວທາງໜ້າເປັນແຂ້ວແມງ,

C : ແຂ້ວທາງໜ້າດ້ານລຸ່ມກໍ່ເປັນແຂ້ວແມງ,

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 2 ປີ) (ບັນທຶກວັນທີ__ເດືອນ__ປີ____)

ໜ້ານີ້ ໄດ້ 2 ປີ ເມື່ອວັນທີ ເດືອນ ປີ

- ສາມາດແລ່ນໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ໃຊ້ບ່ວງກິນເຂົ້າເອງໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ສາມາດໃຊ້ກ້ອນໄມ້ຫຼືອັນໃດໜຶ່ງຍອງຂຶ້ນສູງໆເປັນຮູບທາດຫຼືເຮັດເປັນລົດຫຼືຮູບໃດໜຶ່ງໄດ້ບໍ່?
  ເຈົ້າ ບໍ່
- ເຮັດຕາມປາຫລະທັດຫຼືຜູ້ໃຫຍ່ໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ສາມາດເວົ້າປະໂຫຍກແບບງ່າຍໆ (ເຊັ່ນ ໝາມາ , ຂໍເຂົ້າແມ່ .....ເປັນຕົ້ນ)ໄດ້ບໍ່ສ
  ເຈົ້າ ບໍ່
- ກິນຊີ້ນແລະຜັກທີ່ມີເສັ້ນບໍ່? ເຈົ້າ ບໍ່
- ເລີ່ມຝຶກການຖູແຂ້ວແລ້ວບໍ່? ເຈົ້າ ບໍ່
- ຫຼັງຈາກເດັກນ້ອຍຖູແຂ້ວເອງແລ້ວຜູ້ປົກຄອງຖູແຂ້ວຊ່ອຍບໍ່? ເຈົ້າ ບໍ່
- ມັກຫຼິ້ນແບບໃດ? (ໂຕຢ່າງການຫຼິ້ນ:)
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸຂະພາບ 2 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ_____. ໄດ້____ປີ___ເດືອນ)

ນ້ຳໜັກ	Kg	ລວງສູງ	. cm
ຮອບເອິກ	. cm	ຮອບຫົວ	cm
ຕາຜິດປົກກະຕິ(ລະດັບຕາ,ສາຍຕາ,ອື່ນໆ)	ບໍ່ມີ . ມີ . ສົງໃສ ( )	ຫູຜິດປົກກະຕິ (ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ)	ບໍ່ມີ . ມີ . ສົງໃສ ( )
ມີສຸຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ			

ສະພາບແຂ້ວ											
	E	D	C	B	A	A	B	C	D	E	ແຂ້ວແມງທີ່ຕ້ອງປົວ	ບໍ່ມີ . ມີ (ເຫຼັ້ມ)
											ຄວາມເປື້ອນຂອງແຂ້ວ	ສະອາດ,ທຳມະດາ,ເປື້ອນ
	E	D	C	B	A	A	B	C	D	E	ເຫັນແຂ້ວ.ເຍື່ອເຫງືອກ	ບໍ່ຜິດ, ຜິດປົກກະຕິ( )
											ແຂ້ວເທິງແຂ້ວລຸ່ມບໍ່ຖືກກັນ	ບໍ່ມີ, ຄວນລະວັງ( )
											ກວດໃນ ວັນທີ ເດືອນ ປີ	

ຫົວຂໍ້ທີ່ຊີ້ນຳ	
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ	

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ
		. Kg	. cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 3 ປີ) (ບັນທຶກວັນທີ___ເດືອນ___ປີ____)

ໜ້ານີ້ ຄວນຂຽນໃຫ້ແລ້ວກ່ອນການກວດສຸກຂະພາບເດັກນ້ອຍອາຍຸ 3ປີ .

ໄດ້ 3 ປີ ເມື່ອວັນທີ ເດືອນ ປີ

- ສາມາດຍ່າງຂື້ນຂັ້ນໃດໂດຍບໍ່ໃຊ້ມືໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ໃຊ້ສໍສີແຕ້ມຮູບວົງມົນບໍ່? ເຈົ້າ ບໍ່
- ຢາກນຸ່ງແລະແກ້ເສື້ອງເອງບໍ່? ເຈົ້າ ບໍ່
- ສາມາດເວົ້າຊື່ໂຕເອງໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ຖູແຂ້ວແລະລ້າງມືບໍ່? ເຈົ້າ ບໍ່
- ຜູ້ປົກຄອງຖູ້ແຂ້ວຊ່ອຍບໍ່? ເຈົ້າ ບໍ່
- ດູດນີ້ວມືຕະຫຼອດເວລາບໍ່? ບໍ່ ເຈົ້າ
- ມີນິໄສຫຍໍ້າດີໆແລ້ວຈື່ງກືນກິນບໍ່? ເຈົ້າ ບໍ່
- ມີຕາເສື້ອງບໍ່? ບໍ່ ເຈົ້າ
- ເວລາເບິ່ງອັນໃດອັນໜຶ່ງ ເຮັດຕາຕີບໆເບິ່ງແລະເບິ່ງໃກ້ໆບໍ່? ບໍ່ ເຈົ້າ
- ສິງໃສວ່າໄດ້ຍິນສຽງຍາກບໍ່? ບໍ່ ເຈົ້າ
- ຫຼີ້ນຂອງເຮືອນນ້ອຍ, ຫຼີ້ນລີ້ນມຸດເປັນສັດເປັນຕົ້ນບໍ່? ເຈົ້າ ບໍ່
- ມີໝູ່ຫຼີ້ນນຳບໍ່? ເຈົ້າ ບໍ່
- ມີຄວາມຮູ້ສຶກຫຍຸ້ງຍາກໃນການລ້ຽງລູກບໍ່? ບໍ່ ເຈົ້າ ບໍ່ສາມາດເວົ້າໄດ້
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸກຂະພາບ 3 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້ __ປີ __ເດືອນ)

ນ້ຳໜັກ	. Kg					ລວງສູງ					. cm	
ຮອບເອິກ	. cm					ສະພາບການບຳລຸງ					ຂ້ອນຂ້າງຕຸ້ຍ, ທຳມະດາ, ຂ້ອນຂ້າງຈ່ອຍ	
ຕາຜິດປົກກະຕິ	(ລະດັບຕາ,ສາຍຕາ,ອື່ນໆ) ບໍ່ມີ . ມີ . ສົງໃສ ( )											
ຫູຜິດປົກກະຕິ	(ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ)ບໍ່ມີ . ມີ . ສົງໃສ ( )											
ສັກວັກແຊງປ້ອງກັນໂລກ (ຂີດວົງມົນໃສ່ທີ່ໄດ້ສັກ)	BCG , Polio , Diphtheria(ໂລກຄໍຕີບ), Pertussis , Tetanus(ບາດທະຍັກ) ,Measles(ໂລກຫັດ), Rubella(ໂລກຫັດສາມມື້)											
ຜົນການກວດຍ່ຽວ	ໄປລຕີນ - + ++ +++ ຫຼາຍກວ່າ),occult blood (- + ++ +++ ຫຼາຍກວ່າ) ນ້ຳຕານ(- + ++ +++ ຫຼາຍກວ່າ), ເມັດເລືອດຂາວ(- + ++ +++ ຫຼາຍກວ່າ)											
ມີສຸກຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ												
ສະ ພາບ ແຂ້ວ	E	D	C	B	A	A	B	C	D	E	ແຂ້ວທີ່ເປັນແມງ	O A B C1 C2
											ແຂ້ວແມງທີ່ຕ້ອງປົວ	ບໍ່ມີ . ມີ (ເຫຼັ້ມ)
											ຄວາມເປື້ອນຂອງແຂ້ວ	ສະອາດ, ທຳມະດາ, ເປື້ອນ
	E	D	C	B	A	A	B	C	D	E	ເຫັນແຂ້ວ.ເຍື່ອເຫງືອກ	ບໍ່ຜິດ, ຜິດປົກກະຕິ( )
											ແຂ້ວເທິງແຂ້ວລຸ່ມບໍ່ຖືກກັນ	ບໍ່ມີ,ຄວນລະວັງ( )
											ກວດໃນ ວັນທີ ເດືອນ ປີ	
ຫົວຂໍ້ທີ່ຊີ້ນຳ												
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ												

ການບັນທຶກຈົບກວ່າການກວດສຸກຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		Kg	cm		

ກວດສຸກຂະພາບ 4 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ______. ໄດ້____ປີ___ເດືອນ)

ນ້ຳໜັກ	. Kg					ລວງສູງ					. cm	
ຮອບເອິກ	. cm					ສະພາບການບຳລຸງ					ຂ້ອນຂ້າງຕຸ້ຍ, ທຳມະດາ, ຂ້ອນຂ້າງຈ່ອຍ	
ຕາຜິດປົກກະຕິ	(ລະດັບຕາ,ສາຍຕາ: ຂວາ( ).ຊ້າຍ( )ອື່ນໆ) ບໍ່ມີ . ມີ . ສົງໃສ( )											
ຫູຜິດປົກກະຕິ	(ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ) ບໍ່ມີ . ມີ . ສົງໃສ ( )											
ມີສຸກຂະພາບເຂັ້ມແຂງ . ຕ້ອງສັງເກດ												
ສະ ພາບ ແຂ້ວ	E	D	C	B	A	A	B	C	D	E	ແຂ້ວແມງທີ່ຕ້ອງປົວ	ບໍ່ມີ . ມີ (ເຫຼັ້ມ)
											ຄວາມເປື້ອນຂອງແຂ້ວ	ສະອາດ,ທຳມະດາ,ເປື້ອນ
	E	D	C	B	A	A	B	C	D	E	ເຫັນແຂ້ວ.ເຍື່ອເຫງືອກ	ບໍ່ຜິດ, ຜິດປົກກະຕິ( )
											ແຂ້ວເທິງແຂ້ວລຸ່ມບໍ່ຖືກກັນ	ບໍ່ມີ, ຄວນລະວັງ( )
											ກວດໃນ ວັນທີ ເດືອນ ປີ	
ຫົວຂໍ້ທີ່ຊີ້ນຳ												
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ												

ການບັນທຶກຈົບກວ່າການກວດສຸກຂະພາບເທື່ອຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ__	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ຫົວຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		. Kg	. cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 5 ປີ) (ບັນທຶກວັນທີ___ເດືອນ___ປີ____)

ໄດ້ 4 ປີ ເມື່ອວັນທີ ເດືອນ ປີ

- ສາມາດປີ້ນລັງກາໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ສາມາດແຕ້ມຮູບສິ່ງທີ່ຄົນຈື່ໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ຮູ້ຈັກສີ (ແດງ,ເຫຼືອງ,ຂຽວ,ຟ້າ)ບໍ່? ເຈົ້າ ບໍ່
- ສາມາດເວົ້າໄດ້ຢ່າງແຈ່ມແຈ້ງບໍ່? ເຈົ້າ ບໍ່
- ໄປຖ່າຍໜັກຄົນດຽວໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ລີ້ງແລະມ່ວນຊື່ນກັບຊີວິດຮ່ວມໝູ່ໃນໂຮງຮຽນອະນຸບານຫຼືໂຮງຮຽນລ້ຽງເດັກບໍ່? ເຈົ້າ ບໍ່
- ປະກົດວ່າຮັກສັດແລະດອກໄມ້ແລະ ໃຈດີຕໍ່ຄົນອື່ນບໍ່? ເຈົ້າ ບໍ່
- ກິນເຂົ້າຮ່ວມກັບຄອບຄົວບໍ່? ເຈົ້າ ບໍ່
- ຜູ້ປົກຄອງຊ່ອຍຖູແຂ້ວໃຫ້ບໍ່? ເຈົ້າ ບໍ່
- ດູດນີ້ວມືຕະລອດເວລາບໍ່? ບໍ່ ເຈົ້າ
- ເມື່ອອ່ານເລື່ອງໃຫ້ຟັງ ສາມາດເຂົ້າໃຈເນື້ອໃນໄດ້ບໍ່? ເຈົ້າ ບໍ່
- ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງລູກ, ພະຍາດທີ່ແອນ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸຂະພາບ 5 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ_____. ໄດ້____ປີ___ເດືອນ)

ນ້ຳໜັກ				. Kg			ລວງສູງ					. cm			
ຮອບເອິກ				. cm			ສະພາບການບຳລຸງ					ຂ້ອນຂ້າງຜຸ້ຍ, ທຳມະດາ, ຂ້ອນຂ້າງຈ່ອຍ			
ຕາຕິດປີຫາຍຕິ				(ລະບຸຕາ,ສາຍຕາ: ຂວາ( ). ຊ້າຍ ( ) ອື່ນໆ) ບໍ່ມີ . ມີ . ສົງໃສ( )											
ຫູຕິດປີຫາຍຕິ				(ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ) : ບໍ່ມີ . ມີ . ສົງໃສ ( )											
ມີສຸຂະພາບເຂັ້ມແຂງ. ຕ້ອງສັງເກດ															
ສະພາບແຂ້ວ	6	5	4	3	2	1	1	2	3	4	5	6	ແຂ້ວແມ່ທີ່ຕ້ອງປິດ		ບໍ່ມີ . ມີ (ຫຼັ້ມ)
		E	D	C	B	A	A	B	C	D	E		ຄວາມເຫຼື່ອນຂອງແຂ້ວ		ສະອາດ,ທຳມະດາ,ເຫຼື່ອນ
		E	D	C	B	A	A	B	C	D	E		ເຫັນແຂ້ວ.ເຫືອເຫຼືອກ		ບໍ່ຕິດ, ຕິດປີຫາຍຕິ( )
													ແຂ້ວທີ່ງແຂ້ວລຸ່ມບໍ່ຕົກ ກັນ		ບໍ່ມີ,ຄວນລະວັງ( )
	6	5	4	3	2	1	1	2	3	4	5	6			
													ກວດໃນ ວັນທີ ເດືອນ ປີ		
ທິດຂໍ້ທີ່ຊີ້ນຳ															
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ															

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບຄັ້ງຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ_	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ທິດຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		. Kg	. cm		

ການບັນທຶກຂອງຜູ້ປົກຄອງ(ປະມານ 6 ປີ) (ບັນທຶກວັນທີ___ເດືອນ___ປີ_____)

◦ ນໄດ້ 6 ປີ ໃນວັນທີ ເດືອນ ປີ

◦ ສາມາດປັນຂາດຸງອປະມານ 5 – 10 ນາທີບໍ່? ເຈົ້າ ບໍ່
◦ ສາມາດຂຸນຮູບສີ່ຫຼ່ຽມຕາມໂຕແບບໄດ້ບໍ່? ເຈົ້າ ບໍ່
◦ ສາມາດເຂົ້າໃນ " ທາງໜ້າ , ທາງຫຼັງ " " ຊ້າຍຂວາ " ຂອງຕົນບໍ່ ? ເຈົ້າ ບໍ່
◦ ສາມາດອ່ານແລະຂຸນຊື່ຂອງຕົນໄດ້ບໍ່? ເຈົ້າ ບໍ່
◦ ເຖິງຈະຢາໄດ້ຂອງຫຼິ້ນຫຼືເຂົ້າໜົມຫ໋ຕາມ ແຕ່ສາມາດອົດໃຈ້ໄວ້ໄດ້ບໍ່? ເຈົ້າ ບໍ່
◦ ສາມາດຫຼິ້ນແບບຮ້ວາສັນຍາແລະກົດລະບຽບໄດ້ບໍ່? ເຈົ້າ ບໍ່
◦ ແຂ້ວກ້ຳ 6ປີ (ຟັນແຂ້ວຖາວອນທີ່ເກີດຢູ່ໃນໆຂອງແຖວແຂ້ວນ້ຳນົມ)ເກີດແລ້ວບໍ່? ເຈົ້າ ບໍ່.
◦ ຜູ້ປົກຄອງຊ່ອຍຫູແຂ້ວໃຫ້ບໍ່? ເຈົ້າ ບໍ່
◦ ກິນອາຫານເຊົ້ຳທຸກມື້ບໍ່? ເຈົ້າ ບໍ່
◦ ກະລຸນາບັນທຶກ ຄວາມເປັນຫ່ວງໃນການລ້ຽງດູ, ພະຍາດທີ່ແອບ້ອຍເປັນແລະຄວາມຮູ້ສຶກປະທັບໃຈຕ່າງໆ

ກວດສຸຂະພາບ 6 ປີ

(ກວດໃນ ວັນທີ____ເດືອນ___ປີ_____. ໄດ້____ປີ___ເດືອນ)

ນ້ຳໜັກ				. Kg			ລວງສູງ					. cm			
ຮອບເອິກ				. cm			ສະພາບການບຳລຸງ					ຂ້ອນຂ້າງຜຸ້ຍ, ທຳມະດາ, ຂ້ອນຂ້າງຈ່ອຍ			
ຕາຕິດປີຫາຍຕິ				(ລະບຸຕາ,ສາຍຕາ: ຂວາ( ). ຊ້າຍ ( ) ອື່ນໆ) ບໍ່ມີ . ມີ . ສົງໃສ( )											
ຫູຕິດປີຫາຍຕິ				(ຫູບໍ່ໄດ້ຍິນ,ອື່ນໆ) : ບໍ່ມີ . ມີ . ສົງໃສ ( )											
ສັກວັກແຊງປ້ອງກັນໂລກ (ຂີດວົງມົນໃສ່ທີ່ໄດ້ສັກ)					BCG , Polio , Diphtheria(ໂລກຄໍຕີບ), Whooping cough , Tetanus(ບາດທະຍັກ) ,Measles(ໂລກຫັດ), Rubella(ໂລກຫັດລາມນີ້),ໄຂ້ລະໝອງ ອັກເສບຍີ່ປຸ່ນ										
ມີສຸຂະພາບເຂັ້ມແຂງ. ຕ້ອງສັງເກດ															
ສະພາບແຂ້ວ	6	5	4	3	2	1	1	2	3	4	5	6	ແຂ້ວແມ່ທີ່ຕ້ອງປິດ		ບໍ່ມີ . ມີ (ຫຼັ້ມ)
		E	D	C	B	A	A	B	C	D	E		ຄວາມເຫຼື່ອນຂອງແຂ້ວ		ສະອາດ,ທຳມະດາ,ເຫຼື່ອນ
		E	D	C	B	A	A	B	C	D	E		ເຫັນແຂ້ວ.ເຫືອເຫຼືອກ		ບໍ່ຕິດ, ຕິດປີຫາຍຕິ( )
													ແຂ້ວທີ່ງແຂ້ວລຸ່ມບໍ່ຕົກ ກັນ		ບໍ່ມີ,ຄວນລະວັງ( )
	6	5	4	3	2	1	1	2	3	4	5	6			
													ກວດໃນ ວັນທີ ເດືອນ ປີ		
ທິດຂໍ້ທີ່ຊີ້ນຳ															
ຊື່ໂຮງໝໍຫຼືຜູ້ຮັບຜິດຊອບ															

ການບັນທຶກຈົນກວ່າການກວດສຸຂະພາບຄັ້ງຕໍ່ໄປ

(ກະລຸນາບັນທຶກລວງສູງແລະນ້ຳໜັກທີ່ແທກຢູ່ເຮືອນ)

ວັນທີ____ ເດືອນ___ປີ_	ອາຍຸເດືອນ	ນ້ຳໜັກ	ລວງສູງ	ທິດຂໍ້ທີ່ຊີ້ນຳ	ຊື່ໂຮງໝໍຫຼື ຜູ້ຮັບຜິດຊອບ
		. Kg	. cm		

8

(ບັນທຶກການສັກຢາວັກແຊງປ້ອງກັນພະຍາດ)
Immunization Record

BCG ສັກຢາວັກແຊງປ້ອງກັນໂລກປອດແຫ້ງ			
ວັນ ເດືອນ ປີ ສັກຢາ	Lot. No	ຊື່ແພດຜູ້ສັກຢາ	ໝາຍເຫດ

Diphtheria(ໂລກຄໍຕີບ), Pertussis , Tetanus(ບາດທະຍັກ)						
ໄລຍະ		ຊະນິດວັກແຊງ Vaccine	ວັນ ເດືອນ ປີ ສັກຢາ (ມາຍຸ)	ຜູ້ຜະລິດ, Lot. No	ຊື່ແພດ ຜູ້ສັກຢາ	ໝາຍເຫດ
ຄັ້ງ ແລກ	1ເຫື່ອ					
	2ເຫື່ອ					
ໄລຍະ1	3ເຫື່ອ					
ໄລຍະ1ຟື້ນ						
ໄລຍະ2(DT)						

○ຍ່ອນຍຽນການແພ້ຢາຕ່າງໆ

ຊະນິດວັກແຊງ Vaccine		ວັນ ເດືອນ ປີ ສັກຢາ (ອາຍຸ)	ຜູ້ຜະລິດ, Lot. No	ຊື່ແພດ ຜູ້ສັກຢາ	ໝາຍເຫດ
Polio(ຢາວັກແຊງ ແບບຢອດຢາ)					
Measles(ໄຂສຫັດ) ,	ໄລຍະ1				
Rubella(ໄຂສຫັດສາມີ)	ໄລຍະ2				

ໄຂ້ສະໝອງອັກເສບຍີ່ປຸ່ນ Japanese Encephalitis					
ໄລຍະ		ວັນ ເດືອນ ປີ ສັກຢາ (ອາຍຸ)	ຜູ້ຜະລິດ, Lot. No	ຊື່ແພດ ຜູ້ສັກຢາ	ໝາຍເຫດ
ຄັ້ງ ແລກ ໄລຍະ1	1ເທື່ອ				
	2ເທື່ອ				
ໄລຍະ1ເພີ່ມ					
ໄລຍະ2					

(ຢາວັກແຊງປ້ອງກັນໂລກອື່ນໆ)

ຊະນິດວັກແຊງ Vaccine	ວັນ ເດືອນ ປີ ສັກຢາ (ອາຍຸ)	ຜູ້ຜະລິດ, Lot. No	ຊື່ແພດ ຜູ້ສັກຢາ	ໝາຍເຫດ

(ພະຍາດສຳຄັນທີ່ເຄີຍເປັນຕ່ຳນມໆ)

Record of Childhood Illnesses

ໜ້ານີ້ໃຫ້ຜູ້ປົກຄອງບັນທຶກເອງ

ຊື່ພະຍາດ Illnesses	ວັນ ເດືອນ ປີ ສັກຢາ (ອາຍຸ)	ໝາຍເຫດ(ອາການ,ພະຍາດ ທີ່ແຊກແຊງ)
Measles		
Chicken Pox		
Mumps		
Rubella		
Erythema Infectiosum		
Hand-Foot-Mouth Disease		

School Oral Health 5

School Health

ICHIRO NAKAJIMA
Associate Professor, Department of Pediatric Dentistry, Nihon University School of Dentistry

1. Definition of School Health

School Health refers to all health promotion activity in educational setting. It is a comprehensive health care and health education, first to the children and students and to teachers.
School health promotion is developed by all people who are related to school. It is conducted by full-time employees such as principal, health supervisor, school nurse and school doctor, school dentist, school pharmacist, and school nutritionist as part-time employees.

Purposes of school health are summarized as following three points:

1) To improve health promotion of students as well as teachers.
2) To demonstrate care for necessary health safety education in school as group education.
3) To develop ability to maintain and improve one's own health.

2. School Health Promotion（Example of activity in Japan）

Following is the example of detailed policy to improve school health in Japan.

1) Improvement of health management

To conduct proper health diagnosis and to improve students health management of through follow-up steps. Also, to improve training service to students, implement primary and middle school health management support by placing part-time school nurses in large schools.
Based on "the Standard of School Environmental Hygiene," there will be improvement of inspection and follow-up steps for water quality control, illumination, and air in the classroom.

2) Improvement and reinforcement on sex education including AIDS.

Based on the belief in respect for man's life and dignity/ the right for both male and female, to utilize "Education data for sex education" and students will have appropriate views towards opposite gender,

and will be able to behave appropriately. Concerning AIDS education, a planned education will be reinforced at developmentally appropriate stage.
In order that, there needs to be continuation of training workshop for AIDS and lectures on AIDSA for public schools and handing out AIDS teaching materials.

3) Improvement of education on abusive use of smoking, drinking alcohol, and drugs
To prevent abusive use of smoking, drinking alcohol, and drugs, workshop and training are held for leaders and educators. At present, enlightenment pamphlet will be passed to the school teachers, children and students.

4) Promotion of practical training and study in government appointed health education related school.
In Ministry of Education, Culture, Sports, and Technology/ prefecture appointed particular areas and schools encourage practical education and study for modern health problem solution and utilize its result for health education of schools in each prefecture.

5) Improvement in quality of teachers.
Encourage health supervisor and school nurse to participate practical training, workshop, conference. Also, there is a recognition of school where promotes school, good teeth contest, those who work in school health service. Along with the promotion and enlightenment of health education, quality improvement of school health related personnel by training held by the Ministry of Education, Culture, Sports, and Technology and delegation to the national tournament.

3. School Health Examination

To improve children's health, health research is conducted to the school students of entire country every year by the government.

School Health Statistical Research

- Purpose: To reveal development and condition of children and students and form a foundational data for school health administration.
- Researched items: height, weight, trunk, vision, hearing, and condition of teeth.
- Objects: Kindergarten, primary school, middle school, high school children.
- Measurement: Sampling
- Dates: From 1st of April until 30th June in each year.
- Publication of data: Around December of every year.
School health statistical result news.

Every year around March
School Health Statistical Report

- Division responsible: Life-time study policy department, research and planning section

Prevention of Oral Disease

MASAFUMI MOTOHASHI[1)] and TAKAYUKI KAWATO[2)]
Associate Professor[1)] and Lecturer[2)], Department of Oral Health Sciences, Nihon University School of Dentistry

1. Introduction

Preventive treatments for tooth decay are performed by dental specialists including fluoride application, fissure sealing and professional mechanical tooth cleaning (PMTC). The effectiveness of these treatments has been discussed in many studies. However, the evidence of preventive effect of these treatments on tooth decay is incomplete.

Because tooth decay is caused by multiple factors including life-style related factors, oral health instruction is essential to prevent life-style related diseases such as dental caries or periodontal disease. Health instruction for oral health should be performed according to theory of education. It is not only the knowledge that is essential to make one maintain one's good health, but self efficacy is important for an individual to be able to control diseases by oneself.

2. Method of risk assessment (Caries risk)

1) Concept of dental caries

Dental caries occurs on the tooth crown and on the exposed root surfaces, and cavity develops with infected dentin. Caries occurs and progresses with decalcification of teeth. Decalcification occurs by organic acid (lactic acid and others) which is metabolized substances from mainly monosaccharide and disaccharide in foods by acid producing bacteria in the mouth.

2) Type of dental caries: described by location

Dental caries likely to occur in following places: A) pit and fissure, B) proximal surface, and C) cervical surface. These locations include the area where plaque removal by brushing is difficult and have high-risk of dental caries. On the other hand, areas such as cusp or incisal edge are self-cleansing area where plaque does not accumulate is less likely to become decayed and it is low risk of dental caries.

3) Developing caries lesion (natural history*)

Symptoms of incipient caries in enamel surface are softening of enamel surface, white spot, roughness of enamel surface and pigmentation.

On the area of enamel where white spot is seen, sometimes a strong decalcification under the surface can be observed without decalcification of surface enamel (decalcification of underneath of surface). This phenomenon is explained partly by remineralization of surface enamel after incipient lesion occurred. (* Course of disease when no intervention is applied, such as prevention or treatment)

4) Developing caries lesion

If decalcification of enamel surface is very mild, this part will be remineralized through saliva. It is understood that surface of teeth repeat decalcification and remineralization processes. When the balance will be lost and decalcification becomes dominant, then it will be resulted in dental caries.

5) Successive diseases of dental caries

When a lesion is reached to the pulp, as a successive occurrence of caries, pulpitis or apical lesion occurs. When it progressed even more, distraction of teeth will occur and tooth crown will be completely destroyed. As a result, a root will be left.

6) The mechanism of disease occurrence

A) Role of bacteria in dental plaque

Dental caries occurs by organic acid that is produced by bacteria in dental plaque. Relations between the dental plaque pH and decalcification are indicated by Stephan Curve.

<Mutans Streptococci and Dental Caries>

Mutans streptococci does not only produce acid from lactic acid from carbohydrates, It also produces insoluble gulcan (mutan) from sucrose that is extracellular polysaccharide. Thus, it is considered that among bacteria which forms dental plaque, has an important role in the beginning stage of dental caries.

B) Sugar and caries

Monosaccharide and disaccharide are metabolized by bacteria in dental plaque and becomes organic acid. This remarkably lowers pH in dental plaque; thus such food element highly triggers off the dental caries. Cane sugar (sucrose) especially, makes the insoluble glucan in matrix of plaque which is made by mutans streptococci, so sucrose consumption strongly induces dental caries.

Caries producing potentiality of food is determined by amount of fermentable carbohydrate, especially sucrose. It is also influenced by the requirement of time for consumption, from intake to swallowing. And oral sugar clearance also is a determinant of caries potentiality. It means how long time it takes until sugar around teeth disappears with food substances following the food swallowing.

Whether or not dental caries occurs is influenced by frequency of intake of food with caries producing potentiality than amount of the food itself. Vipeholm study in Sweden indicated that there is an association between the frequency of sugary foods intake and caries increment. The study also indicated that the increment of decay is larger in those who consumed caries producing foods between the meals than at the meals.

C) The role of tooth quality

According to the study of Carlos, an annual caries incidence risk reaches to a peak within few years of eruption, gradually the risk declines. It is believed that minerals such as fluoride are taken into the enamel surface (maturation of enamel surface after eruption) as a result of the exposure to saliva.

Consequently, acid resistance becomes larger by mineralization after eruption.

7) Explanation of etiology of dental caries

From the viewpoint of etiological factors in oral environment, Keyes explained that dental caries occurs when 3 condition of the three factors meet. They are host, bacteria and dietary substrates. In order to indicate importance of time factor, Newbrun explained by using 4 circles including the time factor.

8) Caries activity

A) What is caries activity?

It is a possibility of occurrence of caries and danger of its progress. Even within the same individual, there is a difference of caries activity depending on the age and other conditions (there are daily changes in amount of saliva and accumulation of dental plaques).

High caries activity means that dental caries occurs in short period of time and rapid progress.

One of the extreme examples is milk bottle dental caries.

B) Factors of caries activity

Evaluation caries activity requires consideration of many factors, host factor, bacterial factor, and dietary factor. Furthermore, it is necessary to add time factor which is a time period having an influence. Dental caries activity of a child should be evaluated comprehensively considering it is a multi factorial disease.

C) Caries activity tests

Many caries activity tests have been developed. The purpose of these tests is to predict potentiality of caries occurrence in the future by checking current oral environment. Some tests developed are not commonly used today; however, sensitivity and specificity of the test should be evaluated when we use it.

Factors which can be examined by caries activity tests are bacterial and, host (condition of teeth saliva) factors

(a) Test for host factor

There is a test checking acid resistance of enamel, saliva quality.

- Test for amount of saliva secretion
- Buffering capacity (Product name：Dentobuff strip)
- Glucose clearance test
- Enamel biopsy (this test is not generally used).

(b) Tests for bacterial factors

- Measurement of the amount of particular dental caries pathogenic bacteria

It is a test which examines the number of mutans streptococci.

There are cases using saliva or dental plaque as the object of testing.
(Product name：Dentocult SM)
There is a test which examines the number of Lactobacilli in saliva.
(Product name：Dentocult BL)

・Tests for productivity of bacterial acid
Testing productivity of bacterial acid in saliva (Snyder test)
Testing productivity of bacterial acid in dental plaque (Product name: Cariostat)

D) Characteristic of crucial caries activity testing.

(a) There is a correlation and clinical symptom.
(b) It is highly reliable and accurate.
(c) The result can be obtained in short period of time.
(d) It is easy method.
(e) Minimum facility is needed.
(f) Skill is not required.
(g) Individual test is not costly.

E) Employment of caries activity test

A major purpose of caries activity test is caries risk assessment according to the information which is necessary to determine the requirement of preventing measure. The risk should not be judged by assessment by only one test. Dietary habit and oral hygiene practice should be examined in order to determine the risk of diseases. The following are the purposes of utilizing caries activity tests for caries risk assessment for clinical dentist (Newbrun “Caries science”).

(a) To determine necessity of controlling caries.
(b) For policy of getting patient cooperation.
(c) To determine interval between recalling of reservations
(d) As the index for installation of costly restoration.
(e) For presupposition of prognosis
(f) As a warning sign of band installation for the orthodontist

F) Risk prediction method: Determining caries risk based on the history of disease】

Previous experience of dental caries will become rational index which predicts the future caries tendency. Also it will become a substitution of bacterial tests. However, one uses this method, it is desirable to evaluate excluding the occlusal surfaces (Newbrun “Caries Science”).

9) Reliability of test

		Caries occurrence in certain period	
		Presence of disease	Disease is not present
Result of screening	Positive (+)	True positive (a)	False positive (b)
	Negative (-)	False negative (c)	True negative (d)

a,b,c,d are number of patients tested

<Accuracy of caries activity test>

・Sensitivity and specificity of caries activity test

Reliability of test can be known by the test results of the number of patients at one time and of follow-up examination of the occurrence of caries in certain period of time. Followed by this procedure, calculate sensitivity and specificity of test will be known.

Sensitivity: How the test enables to judge as positive (high risk) for those who will have dental caries in a certain period of time without overlooking.

$$\frac{a}{a + c}$$

Specificity: How the test can correctly judge negative (low risk) for those who will not have dental caries.

$$\frac{d}{b + d}$$

<Positive and negative predictive values>

Reliability of outcome is determined by calculation of positive predictive value and negative predictive value (can use person or teeth as a denomination).

Positive predictive value: The possibility that a person (or teeth) who judged positive (high risk) will have dental caries in a certain period of time.

$$\frac{a}{a + b}$$

Negative predictive value: The possibility that a person (or teeth) who judged negative (high risk) will not have dental caries in a certain period of time.

$$\frac{d}{c + d}$$

3. Preventive method

1) Oral health guidance

Health guidance and health education are important preventive measures against oral disease and promote health of people. Dental caries, periodontal disease and some of malocclusions are lifestyle-related disease. For such diseases, it is necessary to control the risk factors in one's lifestyle. In order to do this, it is necessary to change one's behavior with motivation. For the motivation, state not only the guidance for the behavioral change; but to provide necessary information about etiology of disease, so that the instruction will become understandable.

Health education is often referred in the same meaning as the health guidance. Academically, health education method emphasizes on the learning of health. Health guidance emphasize on the policy of orientation. Health education and health guidance both aim to change one's behavior to have a healthier life. Either method is important to improve one's health maintenance ability.

2) Purpose and philosophy of dental health education

A) Purpose and etc.

Oral health education in public health is important element of its activity, especially to prevent oral diseases. On the other hand, dental caries and periodontal diseases will be prevented clinically. Thus, oral health education is necessary in order to prevent oral diseases, and to have good prognosis. Purpose of the oral health education is to improve one's health by changing one's behavior which changes the lifestyle of individual, and preventing oral disease.

・Philosophy

Health education is a method of establishment of the healthy behavior that is based on the adequate knowledge and proper understanding. It is the approach which emphasizes on the autonomy of health behavior. In order for "Educational approach" to become truly educational, it has to be effective for establishment of autonomous healthy behavior. Healthy behavior which is established by health education is expected to be firm and continuous. In order to establish such healthy behavior it requires inclusive and gradual study.

・Behavioral science

Behavioral science is a study which find out general principles of human behavior from the stand point of biological, sociological and interdisciplinary (psychological, sociological, political, or economical) views. Behavioral science is also defined as follow: "It will develop technology, technical support, as well as environment in order to increase people's consciousness of health and to guide people to maintain a good heath. In order to achieve these, lifestyles and behavior of the people are changed" [National Institute of Public Health, Epidemiology Department, A head of adult disease hospital room, Yuriko Doi]. Principles that are indicated by complicated human behavior in behavioral science can be used for the method of health education.

・Health behavior

Health behavior is a behavior enhances good health such as to prevent diseases, apply treatment, and recovery of health. There are views that only truly effective behavior is healthy behavior. There is another view that every behavior one thinks it good for health is healthy behavior regardless of its effect. However, these two definitions of health behavior often can not be clearly distinguished.

<Definition of healthy behavior (by Munakata) >

"All human behavior patterns that are observed for steps of goof health, such as maintenance, recovery, and enhancement of health"

・Lifestyle and oral diseases and abnormalities occurrence of dental caries and periodontal disease, oral cancer, malocclusion, and temporo-mandibular joint disorder are more or less influenced by lifestyle factors.

・Dietary habit → dental caries
（especially intake of sucrose）

・Oral cleaning performance → Dental caries, periodontal disease
Psychological problem caused by halitosis

・Smoking → Periodontal disease, Oral cancer

・Part of oral habit → Malocclusion

・Stress → temporomandibular joint disorder, bruxism

3) Motivation and behavioral change

A) Motivation

"Motivation" is necessary for behavioral change. In order to make it effective, examine various factors which determine the individual behavioral pattern, then administrate appropriate health education.

B) Behavioral change

A patient and citizens will establish activities for health by improvement of lifestyles. In order to enhance health by "behavioral change," it is necessary for the experts to support the patients.

Health education and health guidance
↓
Lifestyle with high risk → Lifestyle with low risk incidence
(Behavioral change)

In the case of caries

・Reduce amount of sweet food intake which induces the dental caries.

・Establish a habit of effective and through brushing performance.

・Others

4) A model that is related to the human behavioral pattern and determinants

Several theories have been developed for the factors which determine various human behaviors.

A) S-O-R theory of Neo-behaviorism

A traditional behaviorism is insufficient to understand human behavior. That is because the theory is based only on the study of stimulus – response theory. In neo-behaviorism today, considers the organism between stimulus-response theory, and it is commonly understood as S-O-R theory.

$$S \rightarrow O \rightarrow R = f(Xi)$$

The model describes: Action – response (dependent variable) is not only influenced by stimulation but also desire, drive, purpose, habit, heredity, age, mental condition (independent variable).

B) KAP Model

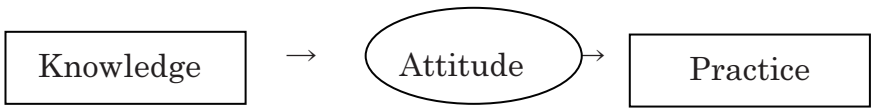
KAP model suggests that acquisition of knowledge will bring change of attitudes. Consequently, Practice will change.

KAP model values the knowledge for the method of behavioral change. Thus, it is effective for prevention of infection but it cannot be applied directly to lifestyle-related diseases.

C) Health Belief Model

Person's perception (acknowledgement) and modifying factor are influenced on the health behavior.

[Figure - Akihisa Tsurumoto]



<Health Belief Model－concept>

・Factors which determines psychological readiness of condition for health behavior

【Susceptibility】 Whether or not disease will easily occur?

【Severity】 When disease occurred, how would it be serious?

・Factors which determines possibility behavioral change

【Effectiveness】 Degree of preventability by changing of behavior and attempt to do a new thing.
【Convenience】 Are there any difficulty or problem for changing behavior and attempt to do a new thing?

D) PRECEDE・PROCEED model, only the main points

These are planning / evaluation models for health promotion and health program.

PRECEDE	PROCEED
The 1st stage (Social diagnose)	The sixth stage (Practice of health policy)
The 2nd stage (Epidemiological diagnose)	The seventh stage (Progress evaluation)
The 3rd stage (Behavior / environmental diagnose)	The 8th stage (Evaluation of effect)
The 4th stage (Education / institutional diagnose)	The 9th stage (The final evaluation)
The 5th stage (Administration, policy diagnose)	

5) What are "Leaning based health education" and "empowerment education"

Leaning based health education and empowerment education are similar in the meaning. In Leaning based health education, the learner is deemed to behave according to self determination. An education expert acknowledges that the subjects are respected; thus, learner's freedom and individual's knowledge and skills for health are required. And careful listening to what the learner says is required for educator. The learner will improve self-management ability of health, and take action of long lasting health behavior

6) What is self effectiveness?

It is one of determinative factors for behavior. In order to obtain expected result one's conviction is related to taking new action. Followings are information source which affect self-effectiveness.

A) Achievement of performance: experience of success in particular behavior.

B) Substitutive experience: observe someone is similar to you and one's behavior that was resulted in success.

C) Linguistic persuasion: to acknowledge one's ability to accomplish behavior well by recognizing by oneself, or other's words, and attitude.

D) Emotional condition: it is an acknowledgement of relax of oneself.

Preventive Measure of Dental Caries

1. Fluoride application for prevention of tooth decay

Because the systemic or topical application of fluoride has a preventive effect on tooth decay, it is widely used as a specific measure for preventing tooth decay. An effective method of fluoride application on the teeth, which dentists can relatively easily carry out, is explained in this textbook.

The incidence of tooth decay has been reduced by 20 to 40% with the application of 2% sodium fluoride solution. There are two types of fluoride application on the teeth: the use of neutral sodium fluoride solution and that of acid phosphate fluoride solution. The latter, which shows preventive effects after only one application, is used in this exercise.

For effective fluoride application on the teeth, it is crucial to understand acute intoxication by fluoride ingestion. The symptoms of such intoxication are digestive-system-related such as nausea, vomiting, abdominal pain, diarrhea and salivation. In serious cases, hypocalcemia results, and symptoms such as coma, convulsion and cardiac arrhythmia are also observed. The lethal dose of sodium fluoride for adults is considered to be 5 to 10 gram. Thus, the solution should be kept carefully.

The threshold amount for the appearance of mild symptoms of acute fluoride intoxication is approximately 2 mg/kg body weight F. Caution is required in fluoride application on the teeth because there is a possibility of mild acute fluoride intoxication, particularly in children if a solution of higher dose is used. In fluoride application on the teeth, the required minimum dose of fluoride solution is used. The risk of acute intoxication can be eliminated by preparing 1 to 2 ml of fluoride solution in a plastic cup, which is enough for one application.

There are two methods of applying fluoride solution on the teeth: the use of a small swab and that of a special tray; there is little difference in their effects. The method using a tray enables the fluoride solution to act on many teeth at one time and reduces the required treatment time; however, the solution is diluted by saliva. On the other hand, the method using small swabs and a pair of tweezers is time-consuming, but the advantage is that the tooth surface is completely dry before application.

1) Procedure Application of 2% NaF solution

Procedure of fluoride application on the teeth will be shown.

(1) Oral examination

Check the status of the teeth during oral examination included in the comprehensive health examination. Determine healthy teeth suitable for fluoride application. Confirm that the subjects consent to the fluoride application, namely, the subjects will sufficiently cooperate with the dentist in the treatment. For young children, the parents' cooperation is sometimes required.

(2) Cleaning of teeth

Remove plaque on all the teeth using a toothbrush or rotary tools.

(3) Determination of unit of subjects' teeth and order of application

The unit for one-time application is half of the upper or lower jaw of the primary and permanent dentitions. Namely, one unit consists of a group of teeth from the left or right central incisor to the second molar in the permanent dentition and that from the left or right central primary incisor to the second primary molar in the primary dentition. However, each of the three groups of teeth, namely, the front-teeth, left-molar and right-molar groups, in the upper or lower jaw can also be determined as one unit.

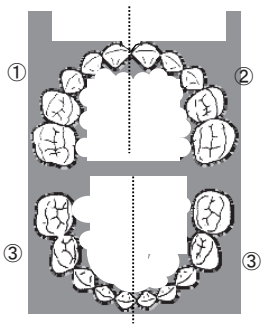
・Example of unit and order of application on teeth groups divided into four groups.

4 units of teeth groups

① upper right teeth → ② upper left teeth

↓

④ lower right teeth ← ③ lower left teeth



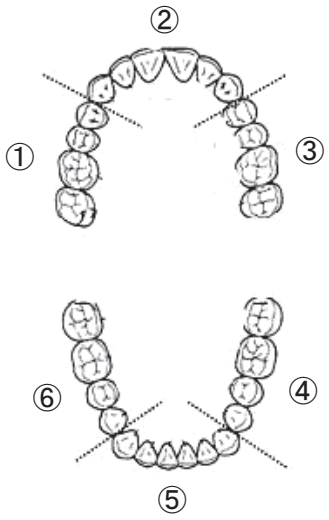
・ Example of unit and order of application on teeth groups divided into six groups

6 units of teeth groups

① upper right molars → ② upper front r teeth → ③ upper left molars

↓

⑥ lower right molars ← ⑤ lower front teeth ← ④ lower left molars



(4) Simple moisture prevention

The adherence of saliva to the tooth surface during the treatment is prevented by the simple moisture prevention method using cotton rolls.

The purpose of the use of cotton rolls is to isolate the tooth surface under application from the tongue, lips and buccal mucosa and to absorb saliva running from salivary glands. The standard number of cotton rolls placed is as follows.

① Application on upper teeth:

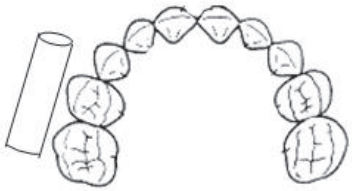
upper buccal side — one or two

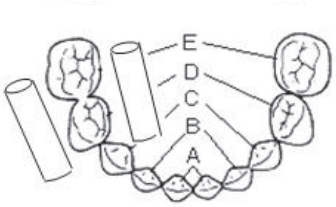
② Application on lower teeth:

lower buccal side — one or two

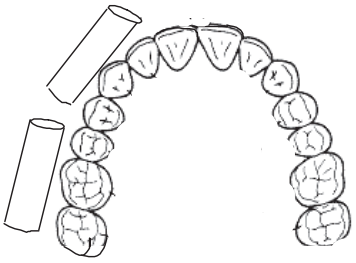
lower lingual side — one or two

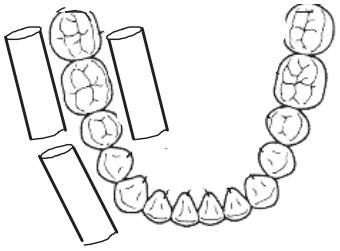
Cotton rolls placed for upper and lower primary molar teeth





cotton rolls placed for upper and lower permanent molar teeth





Cotton rolls must always be fixed firmly, they must be pressed to the position by fingers of dentist especially for lower teeth .

Caution: If you use cotton rolls for children, particularly for infants, you should always hold the cotton rolls with your fingers or with a pair of tweezers so that they do not move. Proper caution is required particularly when the treatment is given while the child is in the supine position.

(5) Application on teeth

Apply the solution on the teeth using tweezers and small cotton swabs. Keep the swab wet for at least three minutes; change the swabs when they become dry to keep the action of the highly concentrated fluoride solution on the enamel surface. Three minutes is important to allow a sufficient amount of fluorine to penetrate into the enamel so that fluoroappatite is formed.

(6) Instruction after fluoride treatment

Instruct the patient to refrain from eating and gargling within 30 minutes after the application. This is to allow more sufficient amount of fluorine to penetrate into the enamel.

2. Pit-and-fissure sealing

Pit-and-fissure sealing is a method of filling a pit-and-fissure of a tooth with a high risk of decay with sealant to specifically prevent decay. This method is often applied to the treatment of the occlusal plane of primary molars and permanent molars. It is highly effective when conducted within a few years after tooth eruption.

The sealant material can be resin or glass ionomer cement. In the method using resin sealant, an etching process for bonding the resin to the teeth is necessary before sealing. Additionally, it is important to maintain a completely dry condition to enhance the bonding effect, which requires moisture prevention using a rubber dam. On the other hand, no etching process is necessary in the method using glass ionomer cement. The latter method is easy to perform because no strict moisture prevention step, such as that required in resin sealing, is necessary; however, its disadvantage is the shorter duration of sealant retention than resin sealant.

1) The procedure of pit-and-fissure sealing.

(1) Selection of appropriate teeth for preventive sealing by oral examination

When a child has teeth with a deep pit and fissure, determine the risk of tooth decay on the basis of several factors, such as the number of years after tooth eruption.

(2) Cleaning and drying of tooth surface

① Clean the teeth using a polishing brush.
② If necessary, remove the content of the fissure with a probe using light pressure.
③ Wash the teeth using an air spray.
④ Blow air on the teeth to sufficiently dry the tooth.

(3) Filling with sealant

Fill pit and fissure with sealant using an applicator.

(4) Checking the hardening of the sealant using a probe.

Reference

1) Tayanin GL, Petersson GH, Bratthall D:Caries risk profiles of 12-13-year-old children in Laos and Sweden, Oral Health Prev Dent, 3(1), 15-23, 2005

2) Tayanin GL, Ramanathan J, Bratthall D : Caries prevalence and some caries related factors for 12 year-old children, Oral Health Prev Dent, 3(1), 15-23, 2005

Screening

1. Screening in public health

1) Purpose of screening

There are two types of screening, disease screening for early detection of disease and risk screening for disease prevention. Disease screening is to classify persons temporally into those who may have the target disease and those who do not have the disease. Disease risk screening is to classify persons into those who are at high risk and low risk of the target disease. Screening must be accompanied by taking effective measure to prevent undesirable event after testing.

2) Principles of conditions of test and target disease

<Conditions of screening test>

The conditions of screening test are as follow:

(1) Reliable

High sensitivity and high specificity

High positive and negative predictive values

(2) Simple

(3) Low cost

(4) Harmless

3) Conditions of the target disease of screening

The target disease of screening should be selected considering some characteristics as follows.

(1) A chronic disease that is long-lasting or recurrent.

Provability to detect chronic diseases is high. However, Provability to detect acute diseases is very low at the time of regular examination carried out once or twice a year.

(2) Prevalence is high to some extent.

Examination is recommended for all people including many who do not have the disease. Though, the burden of examinees is not heavy, benefit to avoid future worse event receiving examination should be large to some extent. Then, the disease of high prevalence should be selected as target disease of screening test.

(3) Unfavorable Prognosis

The target disease of examination is selected from the diseases of unfavorable prognosis. The disease has a serious influence on the quality of life or one's life, if the treatment is not done. Early detection must be beneficial for examinees by changing the course of the disease.

(4) There is a treatment method which leads to cure or improvement.

Dental caries and periodontal disease have four conditions above. They are worth the target disease of screening test in regular oral examination. As the prevalence of malocclusion is high, it is also the target abnormality of screening.
In reality, oral health examination in pubic health may aim at early detection of every oral disease including temporo-mandibular joint disorder. Such a diseases are detectable without complicated method.

4) Oral disease screening

In mass oral health examination, screening tests are carried out to detect diseases and to judge disease risk screening test requires high reliability, validity of its outcome and simplicity. It is essential to evaluate effectiveness and usefulness of the test before using it. The reliability can be evaluated in two aspects, effectiveness and usefulness. In this text, these are defined as follows.

Effectiveness: Sensitivity and specificity
Usefulness: Positive predictive value (rate) and negative predictive value (rate)

These four are rates expressed as 0 to one or 0 % to 100%

5) Method to evaluate reliability (broad sense) of disease screening test and accuracy of test result

(1) Gold standard and cross table

In order to understand effectiveness and usefulness of examination, it is necessary to have a cross table (2×2 contingency table) which indicates relationship of positive (+) and negative (-) examination outcomes and the gold standard.*

* A gold standard is a criterion of a test which can accurately indicates whether the disease is present or not. When evaluating reliability of a test for screening or diagnosis, it is essential to compare the results between the test and another test which serve as a gold standard.
In the case of periodontitis, diagnostic test like periodontal pocket measurement or x-ray examination could be the gold standard. Effectiveness or usefulness of a test screening test cannot be evaluated without the gold standard, no matter what the purpose is clinical diagnostic or mass screening.

		Definite diagnosis	
		Presence of disease	Disease is not present
Outcomes	Positive（＋）	True positive（a）	False positive（b）
	Negative（－）	False negative (c)	True negative (d)

A, b, c, d, are numbers of persons

(2) Effectiveness

It is a characteristic of which is intrinsic of test itself.

Se: Sensitivity **a / (a + c)**

It is a rate of accurate determination of persons with disease as “positive” without overlooking.
It is a rate of persons with the positive results (true positive patients).
It is necessary to conducts high sensitivity examination for disease which leads to a serious condition in the future.
Higher the sensitivity of examination is, it can be stated in confidence, that a particular disease is not existed when the result is negative. This means that high sensitivity examination is used to exclude the target disease.

Sp: Specificity **d / (b＋d)**

It is provability that those who do not have the disease tested are accurately determined as “negative.”
It is a rate of negative (true negative) result in examination among the persons without the disease.
When the result becomes false positive and resulted in placing a heavy burden of close examination on the persons, it is necessary to conduct a test of high specificity.
If the result of high specificity test is positive, it can be assured that there is a disease existed. Thus, use highly specificity for determining the disease.

(3) Usefulness

Positive predictive value **a / (a + b)**

It is a probability of presence of disease when the examination result is positive It is a rate of patient with disease (true positive) among persons with positive outcomes.
Higher the prevalence rate becomes, higher the positive predictive values becomes.

Negative predictive value **d/ (c + d)**

It is a probability of absence of disease when the result is negative.

It is a rate of absence of the disease (true negative) in the persons with the negative results.
Lower the prevalence rate is, higher the negative predictive value becomes.

6) Risk screening test

Similar to screening which is to discover the disease, effectiveness and usefulness of risk screening test can also be investigated. Following chart is the major example of relationship between risk of dental caries occurrence and every test result of caries activity. The gold standard is occurrence of the disease when evaluating accuracy of risk screening.

Understanding risk test result anddisease occurrence

		Occurrence of dusease in a certain period	
		occurred	not occur
Test result	Positive （+）	True positive （a）	False positive （b）
	Negative （−）	False negative (c)	True negative (d)

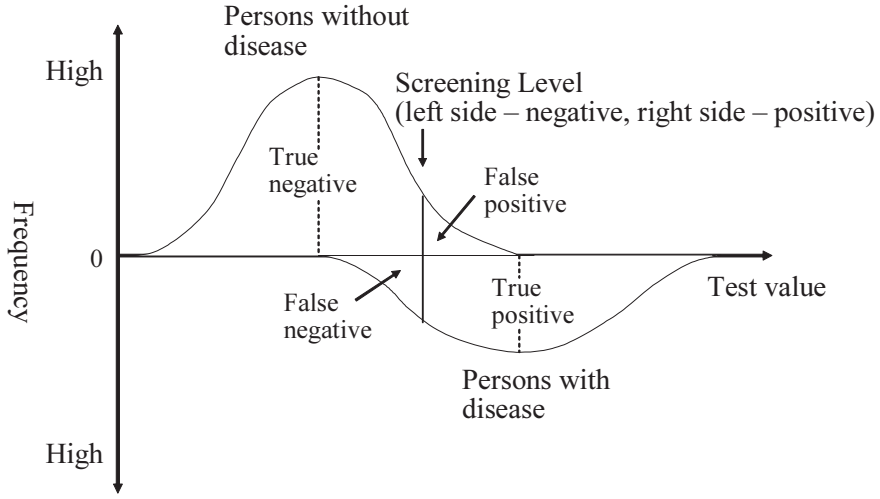
a , b , c , d are number of persons

7) Cutoff point for the test result with continuous value

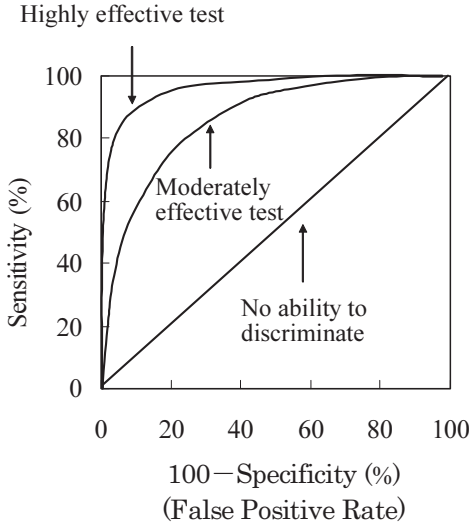
Theoretical model for evaluation of the test result is shown by following figures. When outcome indicates continuous value, decision of the level of cutoff point which classifies test results into positive and negative will be made. In general, when choosing a point which is high in sensitivity, specificity becomes low, and vise versa (Trade-offs between sensitivity and specificity). The basis is to select relatively high point in balance.

A figure below indicates the result changes depending on the selection of the cutoff point. The next figure is ROC curve which indicates the effectiveness of the examination. ROC curve becomes a reference to determine to set the cutoff point.

Distribution of frequency of each test value in two groups of persons with and without the disease tested



ROC（Receiver Operator Characteristic Curve)



2. Purpose and practice of mass oral health examination

1) Purpose of the oral health examination in public health service

Mmultiple screening tests are carried out to detect various types of oral disease and disorders. It is also an opportunity for examinees to be instructed about oral health. Depending on the purpose, there are two types of screening, oral disease screening and risk screening.

(1) Oral disease screening

The purpose of the screening is early detection of disease (dental caries, periodontal disease, malocclusion, and others). By comparatively simple test, persons are classified into those who have and do not have disease.

(2) Disease risk screening (oral cleaning performance, life habit, and others)

The purpose of the test is to prevent disease before its occurrence. It evaluates patient's incidence risk of patient without disease. It determines that necessity of incidence prevention and its method.

【Note】Oral health examination in public health is the health management type of oral health examination: that is to bring benefit of health management to the individual examinees. Another purpose of mass oral examination is to investigate and study. It is distinguished study-type oral examination from the other examination for health management.

2) Practice of the oral health examination

(1) Four types of oral examinations

There are four types of oral examinations for screening and for research / study. In public health promotion, inspection type method which depends mainly on seeing with eyes is used in general.

Type 1	Complete examination	The exam operates under the illumination. It uses mirror and explorer. Full mouth x-ray is together used in the exam. If it is necessary do follows: percussion response, the pulp test, transited bream, study model, and clinical exam.
Type 2	Limited examination	The exam operates under the illumination. It uses a mirror, an explorer, a bitewing radiography examination on the molar. If it is necessary, exam root apex by x-ray.
Type 3	Inspection type examination	The exam operates under the illumination. It uses mirror and explorer.
Type 4	Screening	Under the obtainable illumination, examination is operated with tongue-depressor.

3) Summary of the oral health examination as a project

Concepts and practice of mass oral health examination can be summarized in the next table

.

Content	Its function is disease and risk screening with multiple screening tests and is also an opportunity for health education for health promotion.
Purpose	Early discovery of disease and prevention
Subjects	Including healthy persons with disease risk and persons with disease (including the patient without symptoms)
Examination	Generally, inspection type examination is done (dental mirror and explorer), method as well as questionnaire
Measure after examination	Recommendation for receiving preventive measure, close clinical examination for diagnosis and treatment, treatment, observation
Statistics	Using records, examination outcome will be tallied up in a unit of municipality or national to serve making plan for future oral care service.

4) Examples of mass oral health examination in Japan

Oral health care delivering system is different from country to country with various reasons. However, the recognition of the importance of disease prevention inevitably leads the idea that observation of healthy people at risk of diseases is essential.

The followings are Japanese examples of mass oral health examination for children in public health.

(1) 18 months old and 3 year-old child health examination (Maternal and Child Health Law)

Plaque deposition, tooth eruption, occlusion, dental caries, caries attack type, abnormality of tooth, disease and abnormality of soft tissue and others.

(2) Oral health examination in 3 year-old child health examination (Maternal and Child Health Law)

The basic contents of examination are very similar to those of 18 months old child health examination except malocclusion.

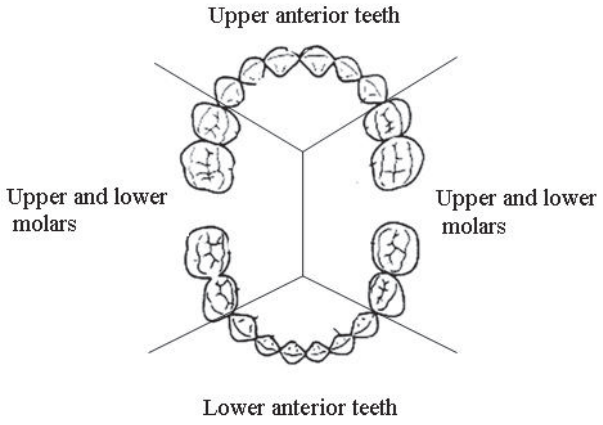
・Dental caries attack type

Dental caries attack type is a classification of the aspect of caries development in primary dentition. Essentially, there are three types, A, B, C according to the severity of attack. A-type is a mild type of caries attack and B-type is a moderate type. And C-type is severe type

A. Types for 18 months old child

Type O_1: Caries free, good oral condition,
Good oral hygiene,
Without too much eating of sweet food and drink in between-meal

Type O_2: Caries free, no good oral condition,
At risk of caries in near future,
Requiring special attention in health instruction



Type A: Caries lesion exists only in upper anterior segment of teeth or only in segment of upper and lower molars.

Type B: Caries lesion exists in both segments of upper anterior teeth and molars.

Type C: Caries lesion exists in all segments of upper anterior teeth, molars, and lower anterior teeth (including cases with caries lesion only in segment of lower anterior teeth).

B. Types for 3 years old child

Type O: Caries free

Type A: Caries lesion exists only in segment of upper anterior teeth or only in segment of upper and lower molars.

Type B: Caries lesion exists in both segments of upper anterior teeth and molars.

Type C1: Caries lesion exists only in segment of lower anterior teeth.

Type C2: Caries lesion exists in segment of upper anterior teeth and / or in segment of molars including in segment of lower anterior teeth.

The item of dentition and occlusion is added to the examination items at oral health examination for one year and six months old child. Concerning about examination of the dental caries, in addition to the examination of every tooth condition, attack type is determined.

5) Risk screening

・18 months old child health examination

Teeth cleaning performance and dietary habit are examined with questionnaire and recorded.

・3 year-old child health examination

In addition to questions for questionnaire in 18 months old examination, the question of frequency of snacking for a day and finishing touch of brushing by the parent are added in the questionnaire.

Note : Caries attack types of O_1 and O_2 are determined by the condition of risk factors related to dental caries.

6) Measure after examination

In oral health examinations at age of 18 months old and three-year old, there are guidelines depending on the caries attack type. Also, as a general determination, there are basic classification of no problem, guidance needed, observation needed, and treatment needed.

7) Regular oral health examination in schools according to School Health and Safety Law of Japan

Mass oral health examination is performed for pupils and students (Kindergarten, primary school, junior high school and high school).

Regular oral health examinations are carried out once a year as a duty of principles.

Disease screening contents and classification of measure after examination in regular oral examination in schools

a. Disease screening contents

・Dentition / Occlusion / Temporo-mandibular joint

[0: normal 1: observation is needed 2: close examination]

・Condition of gingival

[0: normal 1: observation needed 2: close examination]

・Condition of teeth and signs recorded

[present teeth and dental caries－not treated: C treated: ○ lost teeth: △ primary teeth with necessary attention to conservation or extraction: ×, observation needed for suspicious of caries: CO）]

・Other disease and abnormality

b. Contents of risk screening

・Dental calculus (0: none, 1: mild deposition, 2: severe deposition)

・Primary teeth with need of attention: ×, Observation is needed : CO

c. Measure after examination

Followings are post-measures depending on the results of screening

・Instruction for the oral treatment

・Instruction for the close examination

・Instruction for receiving preventive measure

・Special instruction for persons at high risk of oral disease

・Health consulting for oral health

・Regular check up

8) Summary of the contents of examination and measure after examination in Japan

Most of the oral health examination services in Japan are conducted in accordance with the law: it is serviced as a part of national health administration.

Japanese system of oral health care can not be totally applicable to other areas in the world. However, it is an example showing precisely what and how a dentist should do when he have a chance to examine an inhabitant anywhere in the world.

9) Examination errors in oral health examination

It is whether purpose of examination is screening or investigation / study, it is difficult to obtain perfectly accurate classification in mass examination since the tests used require simplicity and functionality. However, examination error should be minimized and it is necessary to calibrate the

method among examiners prior to the examination.

Factors of errors in oral examination are stated as follow:

<Factors that are attributed in method of examination>

- Type of examination (examination, examination＋X-ray and so forth)
- How teeth were cleaned and dried as occasion demands when adhesion of saliva, plaque stain or food deposit interferes with direct vision.

<Factors caused by administration of examination and environment>

- Factor related to fatigue (setting of examination time)
- Illumination and noise
- Utilization of standardized tools
- Clarity of recording method

Understanding characteristics of the population

1. Dental caries experience

1) Index of total caries experience

Epidemiological indices of caries experience are the indices that are calculated based on the data of individuals obtained by examination with certain detection criteria of dental caries. Because the data can be obtained by one time examination, these indexes are widely used in epidemiological studies, as the indication of the group characteristics of dental caries frequency. Indices of caries experience can be used in cross sectional study which needs to obtain information by oral examination at one point in time for examinees.

Indices of caries experience are calculated by using total caries experience based on the observation of the three conditions which are the trait of caries experience. When examining and record dental caries experience of individuals, the teeth with caries experience are recorded as 3 different conditions of decayed (D, d), missing (M, m) and filling (F, f). Capital letters are used for permanent teeth and small letters for primary teeth.

D (d): decayed permanent (primary) teeth untreated
M (m): missing permanent teeth (primary) teeth extracted because of dental caries
F (f): filled (restorated) permanent teeth because of dental caries without secondary caries

Epidemiological study needs to measure the disease frequency with high validity and reliability.

To avoid error to include restorated or missing teeth because of fracture into caries experienced teeth, examiners sometimes need to ask examinees the cause of restoration.

Caries experience in permanent teeth can be correctly measured for children and young adults. However, caries experience can not be measured exactly of an adult group including many with periodontitis. When subject group may include many individuals who have missing teeth caused by periodontal disease, it is difficult to measure caries experience exactly. It is because assurance cannot be made and we can not be assured whether the cause of missing teeth is dental caries or periodontal disease in too many subjects. The indices are employed to measure caries epidemic by the unit of person, tooth, or tooth surface. These are rates or means, DMF person rate and DMFT index for example.

＜DMFT index and DMFS index＞

Instead of using unit as person for the caries experience (the rate of DMF persons), by using the index unit of tooth, or tooth surface, more precise measurement of caries experience can be made. So, in many studies, it is not only DMF person rate but also DMFT index or the rate of DMF tooth is employed. If the frequency of caries experience is less frequent in a subject group, it is even more necessary to use more precise measurements. In Europe and the United States, DMFS index (mean number of DMF tooth surface) is commonly used.

DMFT index (dmft index for primary dentition) indicates the average number of the teeth with caries experience per person in the group. DMFS index (dmfs index for primary dentition) indicates the average

number of tooth surfaces with caries experience per person in the group.

Because primary teeth give its way to the permanent successor erupted and lost, it is often difficult to certainly confirm experience of dental caries in mixed dentition. Therefore, when subject group consists of children (5 to 11 or 12 years old) who are in the period of exfoliation of primary teeth, indices of caries experience dealing with only present teeth are employed. That is because it is difficult to obtain reliable information about caries experience of physiologically lost teeth. In such case, caries experience of the missing teeth will be excluded from the total caries experience. Indices of def and df are employed to measure caries experience of primary teeth. These indices are different from the indices of dmf in the point that missing teeth are excluded from numerator and denominator. In indices of def, “e” is included in place of “m”. “e” signifies the primary teeth that need to be extracted because of caries. In both deft index and defs index, decayed teeth are classified into two categories of “d” and “e”. The df person rate and dft index are slight different from def indices. Indices of df do not classify decayed tooth into two subcategories by the need of extraction like indices of def. Indices of both def and df deals with only present teeth and the result of calculation will be the same for the same group of children. As a result of excluding missing teeth from the observation, calculated rate and mean of these indices will actually become smaller than real level.

Indices of dental caries experience which have been widely used are listed below.

(1) **Person as a unit**

DMF person rate (%) ［dmf person rate, def person rate, df person rate］

$$\frac{\text{Total number of person with DMF [dmf , def, df] tooth or teeth}}{\text{Number of persons examined}} (\times 100)$$

(2) **Tooth as a unit**

DMFT index ［dmft index, deft index, dft index ］

$$\frac{\text{Total number of DMF [dmf , def, df] teeth}}{\text{Total number of persons examined}}$$

DMF teeth rate (%) ［dmf teeth rate, def teeth rate, df rate］

$$\frac{\text{Total number of DMF teeth}}{\text{Total number of teeth of persons examined}} (\times 100)$$

(3) **Tooth surface as a unit**

DMFS index ［dmfs index, defs index, dfs index］

$$\frac{\text{Total number of DMF tooth surfaces}}{\text{Total number of persons examined}}$$

DMF tooth surface rate (%)［dmf tooth surface rate, def or df tooth surface rate］

$$\frac{\text{Total number of DMF tooth surfaces}}{\text{Total number of tooth surfaces of persons examined}} \times (100)$$

Note: For indices of def or df, only the present teeth seen in the mouth are examined.
Index formula for measuring caries experience in permanent teeth and primary teeth.– index inside of [ ] is the index for primary teeth

---

2) Index of proportion of three components of caries experience

On the other hands, the rate of each condition of caries experience in total caries experience is indicated as follow: The rate of decayed teeth, the rate of missing teeth and the rate of filled teeth are as follows.

Decayed Tooth rate (%)

$$\frac{\text{Total number of D [d] teeth}}{\text{Total number of DMF [dmf, def, df] teeth}} \times (100)$$

Missing Tooth rate (%)

$$\frac{\text{Total number of M [m] teeth}}{\text{Total number of DMF [dmf,] teeth}} \times (100)$$

Filled Tooth rate (%)

$$\frac{\text{Total number of F [f] teeth}}{\text{Total number of DMF [dmf, def, df] teeth}} \times (100)$$

The level of rate of decayed teeth indicate the treatment need of dental caries as well as the level of dental treatment service delivery system in the area.

2. The prevalence rate of dental caries

The prevalence rate of dental caries is a rate of the person who has one or more teeth that has been restored or decayed in a defined population. To rephrase, it is the rate of the person who has caries experienced tooth or teeth in present teeth. The prevalence rate of dental caries is used for the subjects of mixed dentition without calculating separately for deciduous and permanent teeth. As this index does not consider the missing teeth, it can not measure caries experience exactly. Many studies adopt the indices of total dental caries experience including missing teeth.

The prevalence rate of dental caries [Indicate by % in general]

$$\frac{\text{Total number of person with untreated and/or filled teeth (caused by caries)}}{\text{Number of examined people}} \quad (\times 100)$$

3. Index (rate) to evaluate the dental caries incidence（occurrence）

1) Person as a unit

To evaluate the risk of caries development, cumulative incidence rate or incidence density can be employed as well as every disease. In cohort study, subject group is classified into some groups according to the presence of a risk factor or degree of a risk factor. In cohort study, cumulative incidence rate or incidence density can be calculated and compared between groups.

(1) Cumulative incidence of dental caries

$$\frac{\text{Number of person who developed dental caries during defined observation period}}{\text{Total number of person at risk who had not dental caries at the beginning of observation}} \quad (\times 10^{2\sim5})$$

(2) Incidence density of dental caries

$$\frac{\text{Number of person who developed dental caries during defined observation period}}{\text{Total person- time of observation*}} \quad (\times 10^{2\sim5})$$

[* If the period is one year, it is called person-year method]

In general, cumulative incidence is easy to employ, because it requires data obtained by examinations carried out only twice at the beginning and end of follow up period. On the other hand, incidence density can be employed when examinations are carried out periodically and observation periods of individuals are different.

It is supposed that the situation requiring incidence density as a measurement tool is rare in cohort study of dental caries. As incidence of dental caries is relatively high, Usually, follow up can be done with almost all the persons involved in the defined population for the observation period long enough to see caries development in as many as persons required.

2) Tooth as a unit

Concept of cumulative incidence rate can be easily applied to the measurement of incidence of dental caries among teeth followed up. In many incidence studies of dental caries, measurement of cumulative incidence is made using unit of tooth. The formula of incidence rate of dental caries in teeth at risk is as follows.

$$= \frac{\text{Number of teeth which developed dental caries during defined observation period}}{\text{Total number of teeth at risk which had not dental caries at the beginning of observation}} \quad (\times 10^{2\sim5})$$

3) Tooth surface as a unit

More precise measurement of incidence of dental caries can be made using unit of tooth surface. RID index is the index that measure incidence of caries by unit of teeth surface. It measures increment of decayed tooth surfaces. RID index can be used for children with mixed dentition. The condition of teeth at the examinations at the beginning (point of time A) and the end of follow up period (point of time A) and the formula is as follows.

		Condition of tooth surface at point of time B			
		Sound	Decayed	Filled	Un-erupted
Condition of tooth surface at point of time A	Sound	$N_{1\text{-}1}$	$N_{1\text{-}2}$	$N_{1\text{-}3}$	$N_{1\text{-}4}$
	Decayed	$N_{2\text{-}1}$	$N_{2\text{-}2}$	$N_{2\text{-}3}$	$N_{2\text{-}4}$
	Filled	$N_{3\text{-}1}$	$N_{3\text{-}2}$	$N_{3\text{-}3}$	$N_{3\text{-}4}$
	Un erupted	$N_{4\text{-}1}$	$N_{4\text{-}2}$	$N_{4\text{-}3}$	$N_{4\text{-}4}$

$$\text{RID index} = \frac{N_{1\text{-}2} + N_{4\text{-}2} + (0.8)\ N_{1\text{-}3} + N_{4\text{-}3}}{N_{1\text{-}1} + N_{1\text{-}2} + N_{1\text{-}3} + (N_{4\text{-}1} + N_{4\text{-}2} + N_{4\text{-}3})/2} \times 100$$

Numerator：absolute increment of carious tooth surface

Denominator：sound tooth-surfaces at risk

【Meaning of signs in RID index formula】

$$\frac{\underset{\boxed{\text{Sound} \rightarrow \text{decayed}}}{N_{1\text{-}2}} + \underset{\boxed{\text{un-erupted} \rightarrow \text{decayed}}}{N_{4\text{-}2}} + (0.8)\ \underset{\boxed{\text{sound} \rightarrow \text{filled}}}{N_{1\text{-}3}} + \underset{\boxed{\text{un-erupted} \rightarrow \text{filled}}}{N_{4\text{-}3}}}{\underset{\boxed{\text{sound} \rightarrow \text{sound}}}{N_{1\text{-}1}} + \underset{\boxed{\text{sound} \rightarrow \text{decayed}}}{N_{1\text{-}2}} + \underset{\boxed{\text{sound} \rightarrow \text{filled}}}{N_{1\text{-}3}} + (\underset{\boxed{\text{un-erupted} \rightarrow \text{sound}}}{N_{4\text{-}1}} + \underset{\boxed{\text{un-erupted} \rightarrow \text{decayed}}}{N_{4\text{-}2}} + \underset{\boxed{\text{un-erupted} \rightarrow \text{filled}}}{N_{4\text{-}3}})/2}$$

Note) Sound means caries-free, natural intact tooth surface

1. Index which evaluates gingivitis

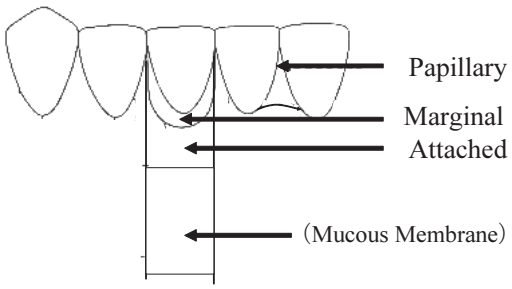
Periodontal disease index is used in survey and epidemiological study. Indices of periodontal disease are classified into two groups , one is for assessment of gingivitis and the other is for assessment mainly periodontitis. Though there are many indices of periodontal disease, only three indices which is widely known or generally used will be described in this text.

1) PMA index

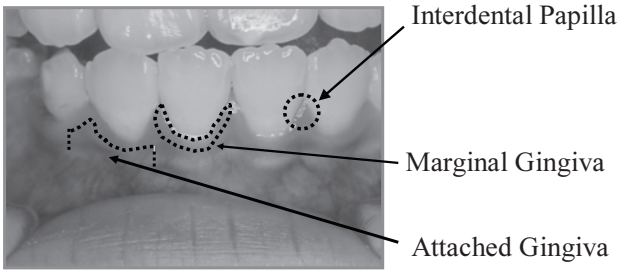
PMA index is one of the index which measures made by Schour and Massler (1947). This index indicates a degree of expansion of gingivitis. It is suitable for assessment of child gingivitis.

Labial side of gingiva of twelve upper and lower anterior teeth is examined. Gingiva is divided into three kinds of area as a unit of assessment. And one point is given to each unit regardless of the kinds if inflammation is observed.

P: Papillary gingivitis
M: Marginal gingivitis
A: Attached gingivitis



Unit (Area) of PMA Index



In many researches, PMA index score for individual person is calculated from the number of areas with inflammation of 12 anterior teeth. When using anterior teeth as the object of the examination, total units of area examined are P is 10, M is 12 and A is 12. Accordingly, if all the units of anterior teeth have gingivitis, the score of the individual will be the maximum of 34.
Gingiva of all the present teeth except third molar may be the subject of assessment. In such a case, maximum total score will be 82.
In reality, inflammation in attached area of gingiva is rarely observed in the persons who have brushing habit.
Assessment of gingivitis prevalence among population as a characteristic of mass is made by average score calculated from the scores of persons.

【Example】
Distribution of Lao children in Pakkading district according to the levels of gingivitis evaluated with PMA index in 2007 is shown in the table.

N:59

Levels	Number of children	Per cent
0	7	11.9
1 ～ 5	12	20.3
6 ～ 10	8	13.6
11 ～ 15	10	16.9
16 ～ 20	15	25.4
21	7	11.9

2) GI (Löe and Silness' Gingival Index, 1963)
The main purpose of creating the gingival index system was to introduce a system for the assessment of the gingival condition which clearly distinguish between quality of the gingival (the severity of the lesion) and the location (quantity) as related to the four (buccal or labial, mesial, distal) areas which make up the total circumference of the marginal gingival (Löe and silness 1963).
It is an index which indicates both severity and expansion of inflammation of gingiva. The gingival index does not consider periodontal pocket depth, degrees of bone loss or any other quantitative changes of in the gingival soft tissue. The criteria are entirely confined to qualitative changes in the gingival soft tissue.

Objected teeth for examination:

6 2	4
4	2 6

Examination criteria for GI

Criteria for the gingival index system

(Score)	(Diagnose)	(Comment)
0	Normal gingival	
1	Mild inflmmation	— slight change in color, slight oedema, no bleeding on probing
2	Moderate inflammation	— redness, oedema and glazing. Bleeding on probing
3	Severe inflammation	— marked redness and oedema, ulceration. Tendency to spontaneous bleeding

Each of the four gingival areas of the tooth is given a score from 0 to 3; this is the GI for the area. The scores from four areas of the tooth may be added and divided by four to give the GI for the tooth. the scores for individual teeth (incisors, premolars and molars) may be grouped to designate the GI for the group of teeth. finally, by adding the indices for the teeth and dividing by the total number of teeth examined, the GI for the individual is obtained, index for the subject is thus an average score for the area examined (Löe H. The Gingival Index, the Plaque Index and the Retention Index Systems. J Periodontol. 1967 Nov-Dec; 38(6): Suppl: 610-6.)

2. Method of assessment for priodontitis (also including gingivitis)

1) CPI (Community Periodontal Index of WHO)

Community Periodontal Index system is a tool to assess the periodontal status of adults and children with permanent teeth. CPI has three indicators, gingival bleeding, calculus and periodontal pockets which are examined using the WHO periodontal probe probe with a 0.5 mm ball tip and black band between 3.5 and 5.5mm and rings at 8.5 and 11.5 mm from the ball tip.

Upper and lower dentitions are divided into 6 sextants (sets of teeth) defined by tooth number: 18-14, 13-23, 24-28, 38-34, 33-43, and 44-48. The highest code (score) of the tooth among the teeth in the sextants will be the code of the sextant. The highest code of the sextants among six sextants becomes the individual's code.

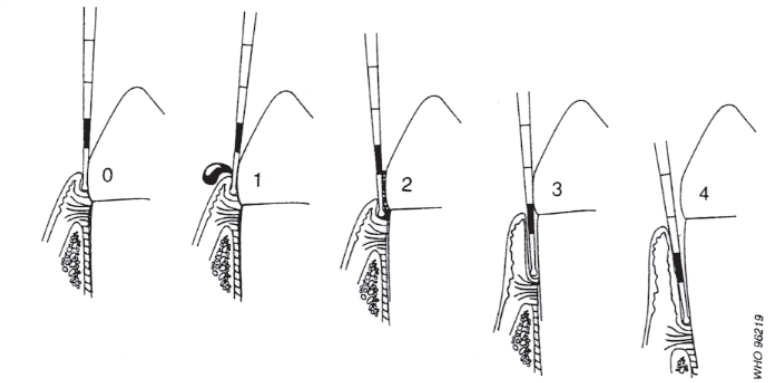
Six sextants

17 - 14	13 - 23	24 - 27
47 - 44	43 - 33	34 - 37

Community Periodontal Index (CPI)

Codes	Criteria
0	— Healthy
1	— Bleeding observed, directly or by using a mouth mirror, after probing.
2	— Calculus detected during probing, but all of the black band on the probe visible.
3	— Pocket 4-5mm (gingival margin within the black band on the probe) .
4	— Pocket 6 mm or more (black band on the probe not visible) .
×	— Excluded sextant (less than two teeth present)
9	— Not recorded

Examples of coding shown by WHO



There are whole and partial examination methods. In partial examination, 10 index teeth are examined for adults aged 20 years and over.

Index teeth

17	16	11	26	27
47	46	31	36	37

For subjects under 20 years old, only 6 index teeth are examined and recorded.

Index teeth

16	11		26
46		31	36

When the children under the age of 15 are examined, pocket depth should not be recorded i.e. code 1 (bleeding), code 2 (calculus) and code 0 are considered and recorded.
WHO probe is used to observe bleeding after probing, to detect calculus and to determine pocket depth by inserting the prove tip gently into the pocket. The sensing force should be no more than 20 grams.
As the ball tip of the probe is thin, the use of too much force will easily cause pain to the examinee. If the force is excessive, pocket depth will not be measured accurately.
Periodontal condition of the population or a certain group is assessed as follows.

Rate of persons with the code of 1, 2, or 3 (more than 0)

$$\frac{\text{Total number of sextants with the code of 1, 2, 3, 4}}{\text{Total number of persons examined}} \times 100$$

It indicates the rate of persons who have one or more of symptoms of CPI.

(1) Rate for each code is also used.

Rate of persons with the code of 0

$$\frac{\text{Total number of persons with code 0}}{\text{Total number of persons examined}} \times 100$$

Rate of persons with the code of 1

$$\frac{\text{Total number of persons with code 1}}{\text{Total number of persons examined}} \times 100$$

Rate of persons with the code of 2

$$\frac{\text{Total number of persons with code 2}}{\text{Total number of persons examined}} \times 100$$

Rate of persons with the code of 3

$$\frac{\text{Total number of persons with code 3}}{\text{Total number of persons examined}} \times 100$$

Rate of persons with the code of 4

$$\frac{\text{Total number of persons with code 4}}{\text{Total number of persons examined}} \times 100$$

(2) Average number of sextants of code of 1, 2, 3 or 4 per person

$$\frac{\text{Total number of sextants with code of 1, 2, 3 or 4}}{\text{Total number of persons examined}}$$

Average number of sextants of each code also is used.

Average number of sextants of code of 0

$$\frac{\text{Total number of sextants with code 0}}{\text{Total number of persons examined}}$$

Average number of sextants of code of 1

$$\frac{\text{Total number of sextants with code 1}}{\text{Total number of persons examined}}$$

Average number of sextants of code of 2

$$\frac{\text{Total number of sextants with code 2}}{\text{Total number of persons examined}}$$

Average number of sextants of code of 3

$$\frac{\text{Total number of sextants with code 3}}{\text{Total number of persons examined}}$$

Average number of sextants of code of 4

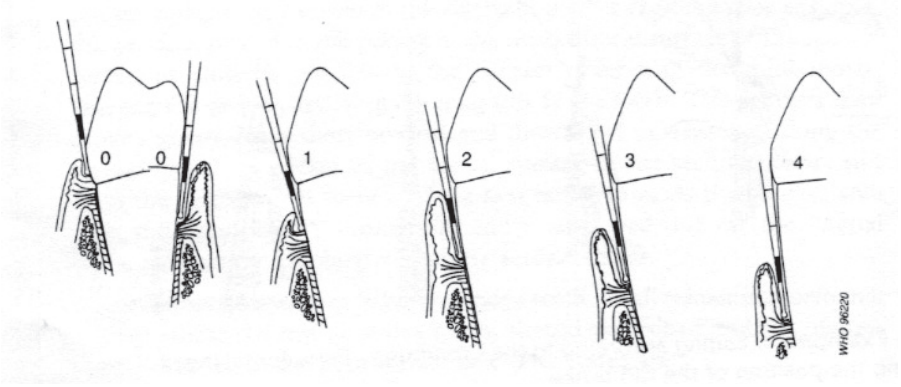
$$\frac{\text{Total number of sextants with code 4}}{\text{Total number of persons examined}}$$

<Attachment loss code>

Lifetime accumulated destruction of the periodontal attachment is measured by using WHO probe. Loss of attachment should not be recorded for children under the age of 15.

In measurement of a distance from bottom of the pocket to CEJ, codes are indicated by 0-4.

Examples of coding for loss of attachment with a CPI probe shown by WHO



3. Example of. Examination standard of periodontal disease in Japanese mass health examination for screening

1) 18 months old health examination

・Disease screening for disease of soft tissues / abnormality (inspection)
（Ginigivitis, tongue, oral mucus, frenum, and etc）

2) 3 years old child health examination

・Disease screening for disease of soft organs/abnormality
（gingivitis, tongue, oral mucus, frenum, and etc）

3) Regular oral health check up in school

・Disease screening for condition of gingivitis

0: normal

1: observation is necessary

2: close examination is necessary

Note) In health examination above, examination for oral cleaning habit and eating habit are conducted as a risk screening.

Examination of Oral Health Condition – Index of Oral Hygiene

Index of oral hygiene and its criteria for mass screening, epidemiological study and clinical examination will be described.

1. OHI (Oral Hygiene Index, Greene and Vermillion,1964)

OHI is used for epidemiological study. The index evaluates the oral hygiene status by total up two score of components of quantified soft deposits and dental calculus.

<Totalize DI (Debris Index) and CI (Calculus Index) and calculate OHI rate>

Examined tooth: all erupted teeth except the third molar

In evaluation of DI and CI, scores of 0, 1, 2, 3 are given. First, to calculate individual person‘s score of debris, separate all erupted teeth into six groups of teeth, upper and lower anterior and posterior teeth except the 3rd molar; then, examine the condition of the soft deposits (debris) on the buccal and lingual side by inspection and explorer.

The surface area covered by debris is estimated by running the side of explorer along the buccal, labial, and lingual surfaces and noting the occlusal or incisal extent of the debris as it is removed from the tooth surface (described by Green and Vermillion).

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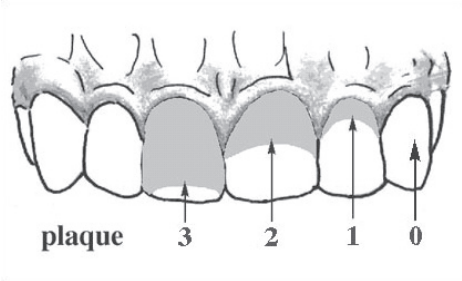
Followed by this process, in accordance of DI examination criteria, find the highest score among teeth of each group separately. Six score from the each group is found and recorded for buccal side and lingual side separately. Then, if all six tooth groups are inspected, twelve figures will be recorded and the value of twelve will be the debris index (DI) of individual person . If the kind of teeth which obtains the highest score can be differed between buccal and lingual sides in the same tooth group, it makes no problem. Calculus Index (CI) is also determined in the same way as debris index according to the examination criteria of CI. Individual person is evaluated by average score of 6 groups of teeth. Accordingly theoretical range of DI and CI score for each person is from 0 to 6 and the range of OHI score is from 0 to12.

Examination criteria of DI



Criteria for classifying debris

Scores	Criteria
0	No debris or stain present.
1	Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered.
2	Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface.
3	Soft debris covering more than two thirds of the exposed tooth surface.

Criteria for classifying calculus

Scores	Criteria
0	No calculus present
1	Supragingival calculus covering not more than third of the exposed tooth surface.
2	Supragingival calculus covering more than one third but not more than two thirds of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both.
3	Supragingival calculus covering more than two third of the exposed tooth surface or a continuos heavy band of subgingival calculus around the cervical portion of the tooth or both.

OHI individual person's value by summing up DI and CI

$$OHI = DI + CI$$

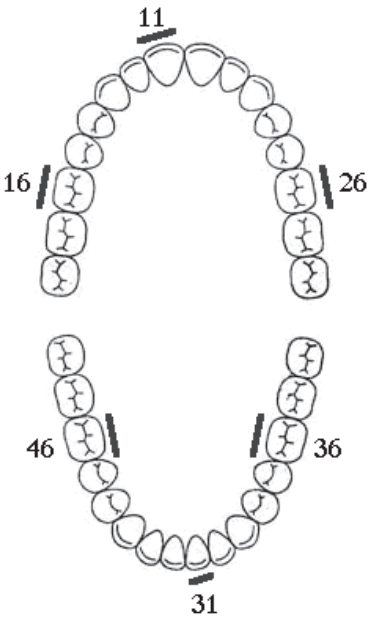
In assessment or epidemiological study, based on the individual value, mean score of a group of people which indicates the mass characteristics can be calculated. There is a method which examines by utilizing plaque disclosing agent. In this case, it is necessary to examine the dental calculus before hand.

2. OHI-S (Oral Hygiene Index Simplified)

Examination criteria of OHI-S is the same as OHI. However, object teeth of the examination (index teeth) of OHI-S differs from OHI; it only examines buccal or lingual surface of each 6 index teet.

Six index tooth surfaces:

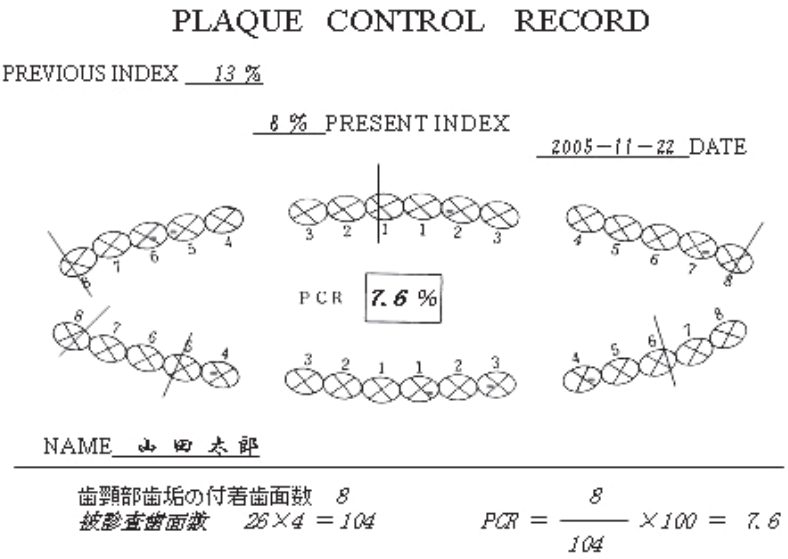
- Labial surface of upper right central incisor
- Labial surface of lower jaw left central incisor
- Buccal surfaces of upper first molars of both sides
- Lingual surfaces of lowerr first molars of both sides



The range of DI-S and CI-S score for each person is From 0 to 3, respectively, and the range of OHI-S score is from 0 to 6.

3. PCR (Plaque Control Record)

This method was developed to evaluate oral hygiene performance of patients. Effectiveness of evaluation for health guidance can be evaluated by applying this method using evaluations before and after health guidance. Disclosing agent is applied for whole teeth. If there is dental plaque adjacent to gingival margin on 4 tooth surfaces (buccal, lingual, mesial and distal tooth surfaces), 1 point is given for the surface with plaque. Individual person's score is a rate of tooth surface with dental plaque among surfaces of present teeth, usually indicated in per cent.



Standard of examination concerning oral hygiene in mass health examination

1) Oral health examination in Japan at 18 months old

Disease screening	・Disease/abnormality of soft organs (inspection) (gum, tongue, oral mucous, frenum, and etc.)	Present	Not present
Risk screening	・Teeth Cleaning (questionnaire)	Do	Do not
	・Dental plaque deposition（inspection）	Good	Bad

2) Oral heal examination for three years old

Disease screening	・Disease/abnormality of soft organs (gum, tongue, oral mucous, frenum, and etc.)	Present	Not present
Risk screening	・Teeth cleaning	Do	Do not
	・Final tough of brushing by parent (questionnaire)		
	・Dental plaque depositon (inspection)	Good	Bad

3) Periodical oral health examination in Japanese school

Disease screening	・Condition of gum	0（normal）	1 (to be observed)	2（reexamine）
Risk Screening	・Condition of dental plaque	0（Good）	1	

Investigation of health related factors

1. Health related factors

Health related factors are classified into three categories from the epidemiological viewpoint.

1) Agent
2) Host factors
3) Environmental factors

2. Classification of environmental factors

There are many factors which have an influence on people's health. These can be classified into two major categories.

1) Social factors	Culture
	Socio-economic status
	Health care system
2) Natural factors	Ecology
	Climate

3. Questionnaire investigation of dietary habits

1) Purpose of questionnaire in oral health sciences

Much information could be obtained from the subjects effectively by questionnaire helped by the cooperation of subjects. In addition to its effectiveness to gather much information in a short time, questionnaire has an advantage of knowing about mental functions that only the person could know. Questionnaire method is essential to get information of emotion and idea likes and dislikes of sweets is one of the examples.

Questionnaire is one of the tools to gather data on behavior of people and oral disease. As dental caries and periodontal disease have an association with dietary habit, many questionnaire researches have been carried out to investigate association between the dental caries and various factors related life style.

2) Dental caries in children

It is well known that between meal habits have an association with dental caries. Weiss* revealed the association of the frequency of eating snack with high caries producing potentiality and caries experience (dmf) in children. The study focused on the food substance potentially produces caries. The study showed positive correlation of the frequency and the number of dmf teeth. It is essential to include caries producing potentiality into consideration of questionnaire construction. The methodology of questionnaire can be known by the study which Weiss reported as an example.

**Robert L. Weiss, Albert H. Trithart, BETWEEN-MEAL EATING HABITS AND DENTAL CARIES EXPERIENCE IN PRESCHOOL CHILDREN*

4. Questionnaire investigation of oral hygiene habit

The purpose of the studies of oral hygiene habits is to find out problems in life style which promote development of oral diseases, mainly dental caries and periodontal disease. Many potential risk factors of oral diseases will be investigated. The factors of interest which should be selected will be different from population to population as cultures are different from country to country. In the investigation analyzes the relationship between causal factors and the oral diseases. Essential questionnaire items are as follows.

- What kinds of tools are used to clean teeth (tools)
  - Tooth brush
  - Dental floss
  - Others
- Whether toothpaste is used or not.
  - If it is used, what kind is used?
- How many times are the tools used in a day (frequency).
- When each tool is used in a day (time).
- Who cleans your teeth? (in case of children or handicapped persons)
  - By oneself
  - With help of mother
  - By mother
  - Others
- Items of interest from the viewpoint of achieving study purpose.

【An example】

The table shown here is a questionnaire used to investigate causal factors of dental caries in primary school children

Questionaire about Eating Habit in Children Recorded on_____(Day) _____(Month) _____Year

Recorded by _____ (Examiner)

name		male・female	date of birth		grade	

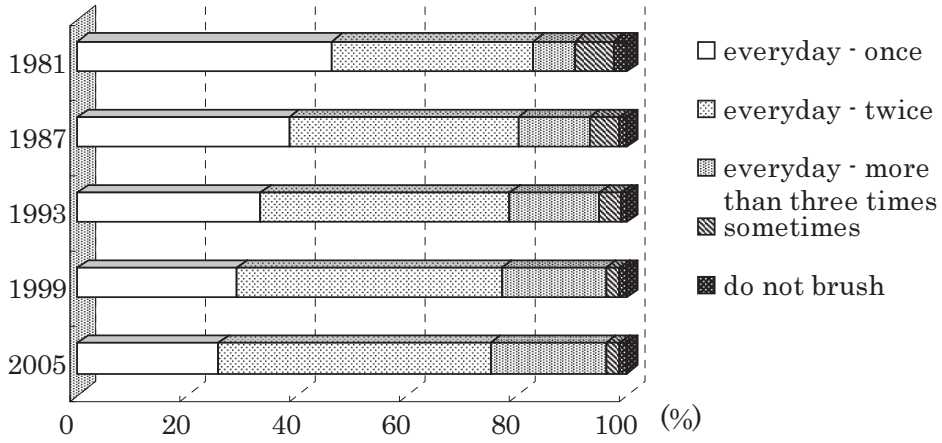
Q1 How many times do you have meals every day ?	( ) None	( ) Once every day	( ) 2-times/day	( ) 3-times/day	( ) More than 3-times/day
Q2 How many times do you have between meals every day ?	( ) None	( ) Once every day	( ) 2-times/day	( ) 3- times/day	( ) More than 3-times/day
Q3 How often do you eat dried fruite?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) More than 3-times/day
Q4 How often do you eat Soft/sweet drinks ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q5 How often do you eat candy ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q6 How often do you eat Sweet Gum ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q7 How often do you eat Chocolate ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q8 How often do you eat cake ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q9 How often do you eat other sweet local snack ?	( ) None	( ) Occasionally	( ) Once every day	( )2-3 times/day	( ) more than 3-times/day
Q10 Do you like sweets ?	( )hate sweets	( ) do not like sweets	( ) like sweets a little	( )like sweets very much	
Q11 what is your favorate foods ?	(				)
Q12 How many times do you brush your teeth ?	( ) None	( ) Occasionally	( ) Once every day	( )2 times/day	( ) More than 3-times/day

【Reseach on the oral cleaning habit】

Reseach on the oral cleaning habit is carried out using information by questionnaire. Items usually asked were as follows.

- Regularity and frequency of tooth brushing of tooth brushing
- What kind of toothbrush is used?
- About use of toothpaste and its characteristics
- About use of devices which give an additional effect
  : Dental floss, toothpick, inter-dental brush etc.

The figure illustrates the change in the frequency of tooth brushing in Japanese people except infants. This is the data of Japanese survey on dental diseases performed every six years This is an example of survey on oral cleaning habit with questionnaire.



Reference: Survey by Questionnaire

HIROFUMI ABOSHI
Assistant Professor, Department of Legal Medicine, Nihon University School of Dentistry

The construction of a questionnaire requires planning, preparation and implementation, totaling and analysis, reporting, dissemination and application of the information. Every step is important but without good initial planning it is difficult, if not impossible, to obtain reliable data. If the collected data cannot be trusted, no matter how good the statistical method used to analyse the data, a good outcome is unable to be obtained and the results will be meaningless.

In order to plan the survey, it is necessary to clarify the research objective. This means knowing the purpose of the research and how the research outcomes will be utilized. There are two types of questionnaire method: administration of a survey to establish a hypothesis and verify using the collected data (hypothesis verifying method); and understanding the circumstance of an event by surveying and interpreting responses (apprehending circumstances).
Statisticians refer to a whole research group as the "population." Information derived from all the population is called "whole number" data, while extracting selective numbers from the population is called a "sampling study."
Generally, a large survey takes time and financial cost and it is thus difficult to sample the whole population. Even if it is possible to survey the entire population, data analysis costs can be prohibitive. Also, non-sampling errors (e.g., in the example of researching by interview, as the number of interviewers is increased there will be much more bias and difference among the interviewers will increase. Therefore, the whole number survey is not always the most desirable method, sampling studies are often preferred.

In the case of sampling studies only selected members from the population are examined or interviewed. The selected group is referred to as the "sample" and to the process of selecting from the population is called "sampling." With this method trends for the whole population are inferred, reasoned, and speculated from the results of the sample. For the inferred population characteristics to be reliable sampling should be done in a manner which is representative of the entire population and to minimize errors.

1. Time of implementation

Depending on the contents, answers in questionnaires will be affected by the administration time. Thus, in some cases, it is necessary to consider appropriate timing of implementation prior to the survey.

2. Method of survey

There are several ways of collecting data by questionnaires. Followings are introduction of major studies.

1) Collective survey

Gather the subjects of the study in one place and ask questions.

Advantages:

It allows the survey to be conducted over a short period of time and a number of questionnaires are collected at once.

Disadvantages:

People required to prepare ahead of survey such as reserving a meeting place and contacting participants to advise time and location of meeting.

2) Interview method

Researcher visits subjects individually ask questions directly. Answer is given when the question is asked.

Advantages:

A researcher can meet subject directly, so answer is certainly obtained, rate of answers is high, errors are few, and reliability of the data is high. Also, it is easy to explain the meaning of any ambiguous questions.

Disadvantages:

It takes time to train researchers to ensure consistency across the team. The quality of interviewer skills will affect the outcome. Also, it is costly to pay for those staff.

3) Detention method

Distribute questionnaires to potential participants and ask them to cooperate with the study. The researcher will then collect answered questionnaires at a later date.

Advantages:

Even if there are many questions, participants can answer at their own convenience. Also, it is possible to answer to difficult questions by interview when the surveys are collected. It is an effective method for a lengthy survey.

Disadvantages:

It is difficult to determine whether answer is given by the participant themselves, they may have sought advice or been influenced by family members. Two visits are necessary for distributing the survey and collecting completed questionnaires. As a result transportation and personnel costs become costly.

4) Mailing method

Send questionnaires to potential participants. Completed questionnaire is then returned by participant.

Advantages:

A large number of participants can be involved for a minimal cost.

Disadvantages:

A list of names and current addresses of potential participants is necessary. The response rate is generally low.

5) Phone call method

Researcher will call potential participants and ask questions. In this method, the number of questions should be few and the time should be brief.

Advantages:

If telephones and researchers are prepared, it can be done within a short period of time. A large number of surveys can be completed in a short period of time with low cost. It is less likely that personal questions will be asked.

Disadvantages:

It is difficult to confirm participant interest and approaches are often rejected. It is not suitable for questions which take time and are complicated.

3. Questionnaire writing

Questionnaires should be written in an easy to understand manner. They should not be confusing or ambiguous. It is necessary to consider what questioning and answering methods are appropriate.

There are following types of questions:

1) Free writing style questions

one can freely answer the question. The answer can be a word, letter, numbers, or picture.

2) Pre-coded type questions

questions where the answer is chosen from numbered and signed answer groups.

3) Multiple choice questions

- Single answer (choose one answer)
- Multiple answers/unlimited number of answers (can choose multiple answers).
- Multiple answers/limited numbers of answers (only request number)

4) Numbering question (place the number against answers).

- Number in complete order (place numbers on all choices).
- Partially place the numbers (limited number of precedence orders).

Note for selecting choices such as:

(1) Exclusive to one another (meaning of choices different to one another).

(2) It is needs to be thorough (there are possible choices).

4. Criterion

In order to obtain statistically processing data is that it is necessary to measure by criterion. There are four criteria:

1) Nominal criterion

2) Priority criterion

3) Distance criterion

4) Comparative criterion

Nominal criterion and Priority criterion provide qualitative data while Distance criterion and Comparative criterion give quantitative data.

The most common criterion is distance criterion. Choices for this criterion, for instance uses 5 stages of evaluation. 3 is middle point and 4/5 are "good" and 1/2 are considered "bad." Some people believe that 1-5 are considered "good" and the answer is dependent on the of degree of "excellent." In such cases, it is necessary to define the middle point.

5. Tabulation and Analysis

1) Simple tabulation・・totalize the number of people each time question is answered.

2) Cross tabulation・・combine 2 questions and totalize. It enables analysis of the relationship between 2 questions. It also is used for checking.

Simple tabulation is used for all questions but cross sum combined only for related questions.

To determine which questions should be combined we use a matrix chart.

6. Statistical analysis

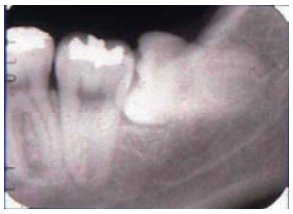
See other reference and text for further information for statistical management of questionnaires.

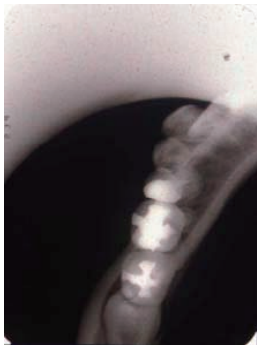
Oral Surgery and X-ray image

- **Extraction of tooth**
- **Infection**
- **Cyst**

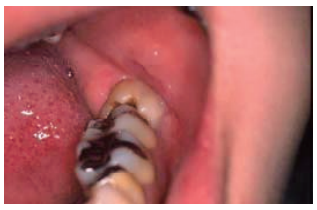
Yoshiyuki Yonehara
Professor, Department of Oral and Maxillofacial Surgery,
Nihon University School of Dentistry

X-ray image of impacted teeth

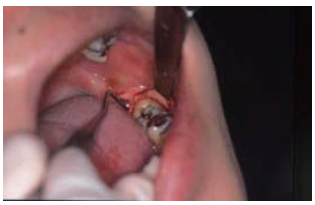




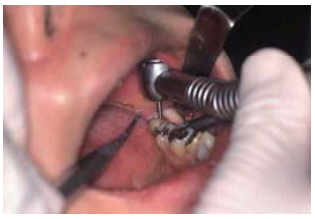
preoperative oral inspection

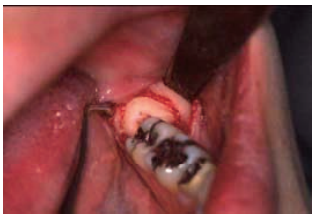


Incision of gingiva

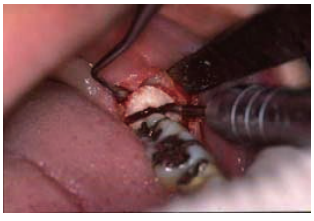


cutting of tooth crown

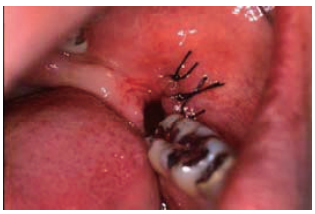




cutting of root

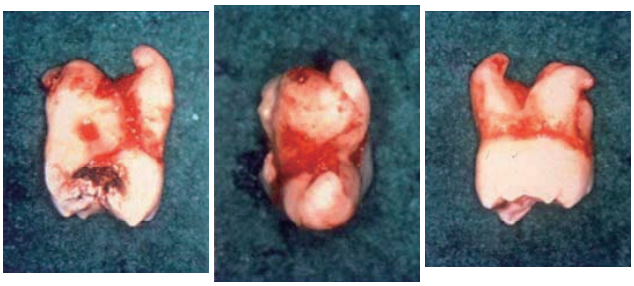


suture of gingiva

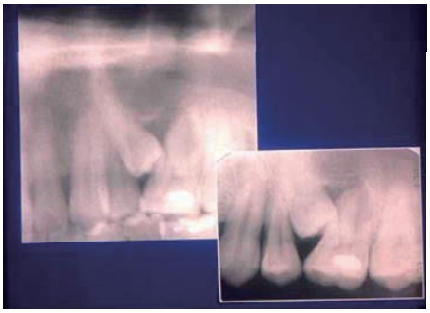


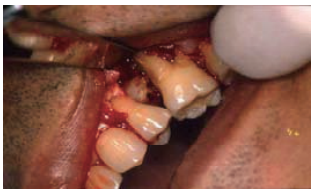
X-ray image of maxillary impacted teeth

Extracted tooth

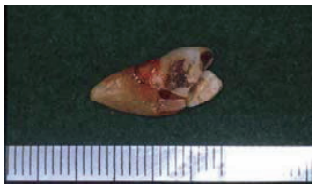


X-ray image of maxillary premolar





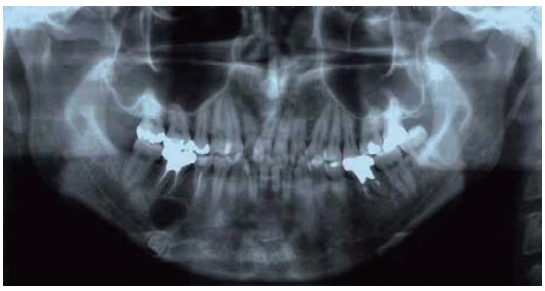
under operation



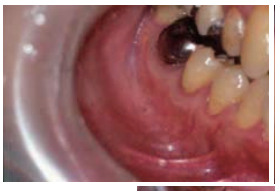
extracted tooth

X-ray image

excess impacted teeth & radicular cyst

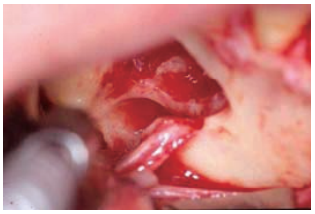


before operation

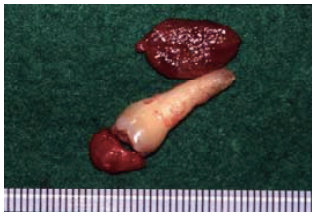


caution! mental foramen

bone window & mental nerve

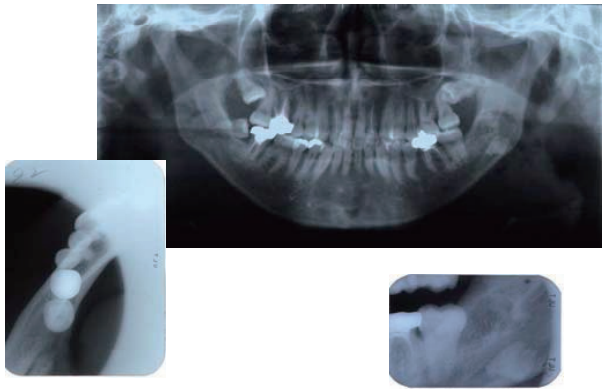


extracted tooth & cyst

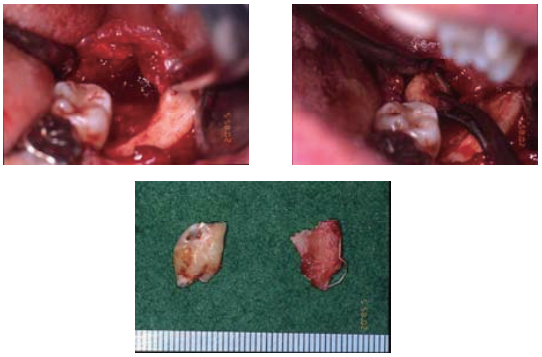


X-ray image

aberrent mandibular 3rd molar

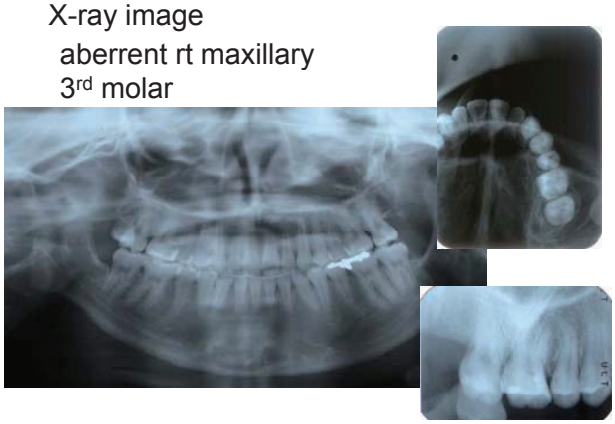


Aberrent tooth root & fractured lingual cortex bone

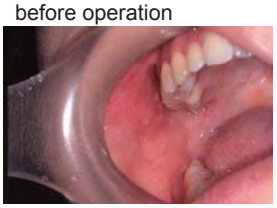


X-ray image

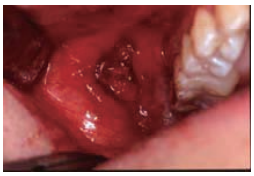
aberrent rt maxillary 3rd molar



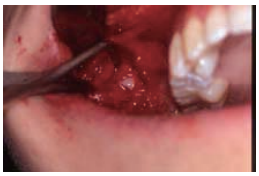
before operation



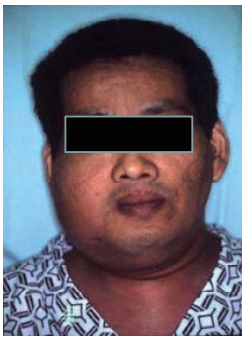
incision



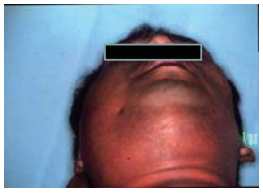
extraction



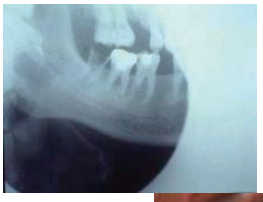
Abscess

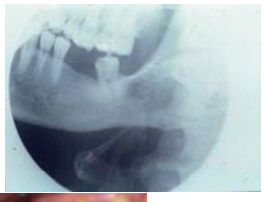


cast of the face

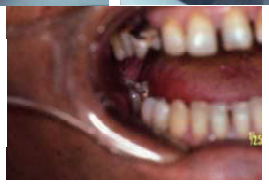


X-ray image

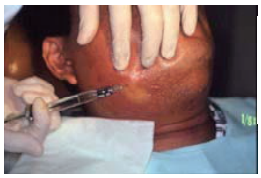
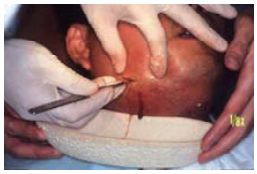
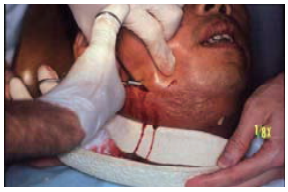




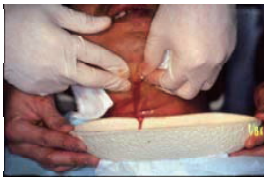
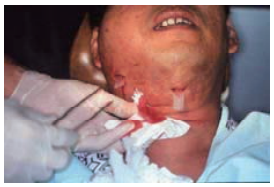
oral inspection condition



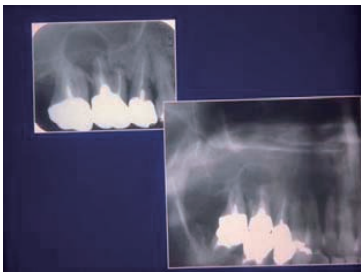
incision & pus discharge

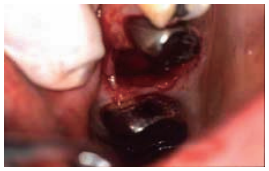




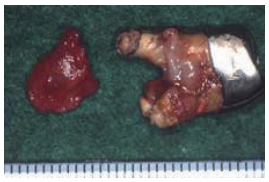
drainage

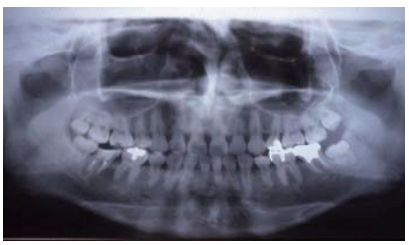
Rt maxillar 1st molar radicular cyst




under operation

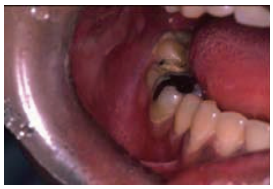
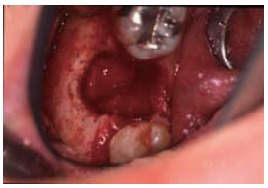

extracted tooth & cyst

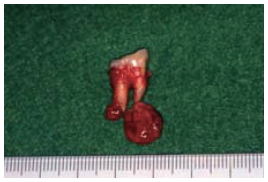
Rt mandibular 2nd molar radicular cyst



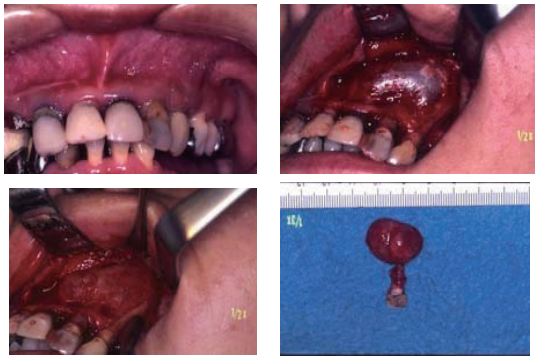
before operation

after extraction

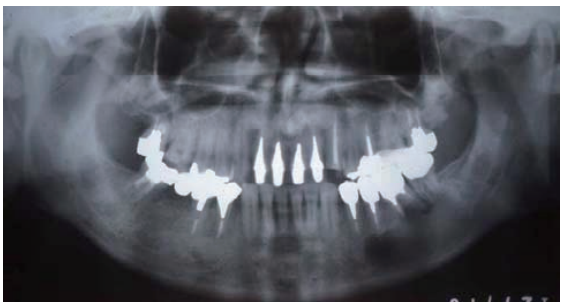




extracted tooth & cyst

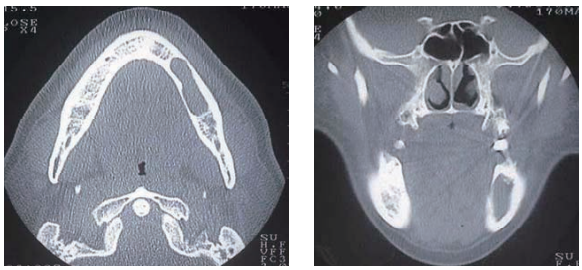
Lt maxillary lateral incisor radicular cyst



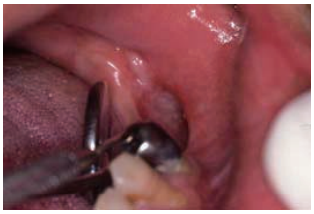
Lt mandibular cyst



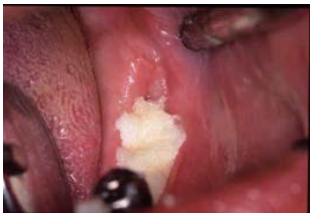
Computed Tomographic image



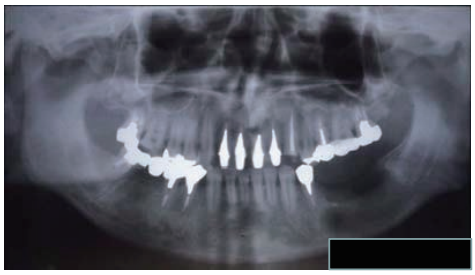
extirpation & open therapy



changing packed gauze



Extirpation & open therapy



1-month after the operation

Case Studies 6

1. Khamsing Sypraseuth	Case study of Clinical Dentistry (Ludwig's Angina and odontogenic infection)
2. Phay Duoangsy	Case study of Clinical Dentistry (Maxillary Fracture)
3. Khamsing Sypraseuth	Case study of Clinical Dentistry (Zygomatic fractures)
4. Khamsing Sypraseuth	Case study of Clinical Dentistry (Mandibular fracture)
5. Phay Duoangsy	Case study of Clinical Dentistry (Radiographic Technique)
6. Phay Duoangsy	Case study of Clinical Dentistry (Muscular-skeletal History and Physical Examination)
7. Khamsing Sypraseuth	Case study of Clinical Dentistry (Radicular Cyst)

Ludwig's Angina and odontogenic infection

Khamsing Sypraseuth M.D.
ENT Department
Mittaphab Hospital
February 2010

Wilhelm Friedrich von Ludwig's first report in the year 1836

- It's a severe infection beginning at apex of molar's root and spreading into the spaces of tissue around the mandible (sublingual, submandibular and submental at both side)
- In form of painful gangrenous cellulites with rapid swollen pushing the tongue more posterior obstructing of respiratory air way
- Complications:

-Deep neck infection (arriving of infection to tissue of posterior part of pharynx).
-Descending necrotizing mediastinitis
-Aspiration pneumonitis

Grodinsky criteria

- Infection is in form of cellulites but not abscess in sublingual and submandibular spaces with special characteristics:

1. infection spread in all spaces and at both side
2. in form of gangrenous infection with serosanguineous discharge and putrid infiltration
3. infection only of tissue and muscle but not glandular structures.
4. Propagation only tissue to tissue but not by lymphatic pathway.

Etiopathogenesis

- Frequently at the second or third lower molar teeth.
- Teeth extraction.
- Operation on floor of the mouth.
- Male > Female.
- Rare in children.
- Bacteriology:

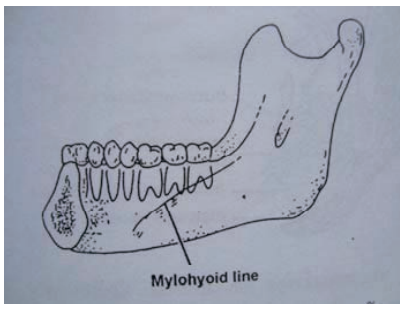
-Aerobes: * Streptococcus
* Neissaria (gram neg. bacilli)
-Anaerobes: * Streptococcus
* Peptococcus
*Eubacterium
*Fusobacterium

Pathogenesis

- Anaerobes bacteria begin first in the subcutaneous tissue, following by anaerobes when oxygenation decrease.
- The cause of the diffusion of bacteria is the pulpite at the apex causing a partial necrosis, an inflammation, a vasodilatation and an edema in the alveolar process. When no treatment the edema in the limitation area it will give a strangulation and a partial necrosis of the apex, in that way infection can harm the mandible and the soft tissue.

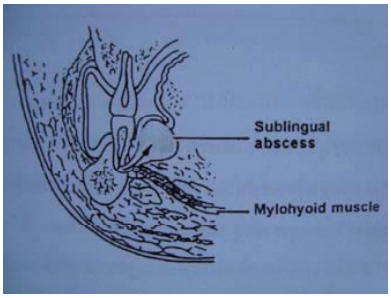
Insertion of mylohyoid muscle

- A



Mandibular spaces

- Primary spaces: Perforation in to the sublingual space from premolar and molar teeth.

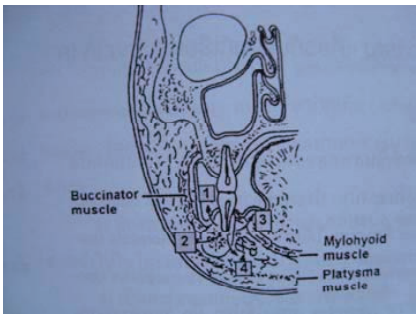


Primary spaces:

- Sublingual space situated between submucosa of floor of the mouth and mylohyoid muscle which separate the sublingual and submandibular spaces.
- Only infection above the line of insertion of mylohyoid muscle can penetrate into the sublingual space(premolar and first molar teeth).
- The apex of the third molar is under the line of insertion of mylohoid muscle, the infection can arrive into both the sublingual and submandibular spaces.
- Submental space is between the inferior ridge of mandible and hyoid bone. Laterally between the anterior belly of digastric muscle at both side. Infection of incisor can arrive to this space.

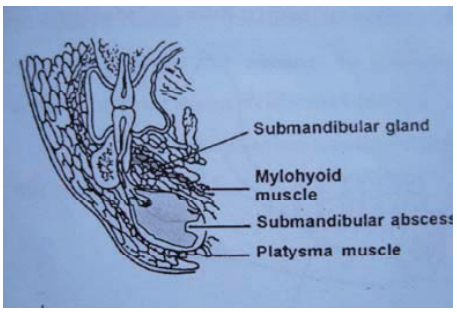
Different primary spaces:

- 1. vestibular abscess(above buccinator) 2. Buccal space(cheek: below the buccinator) 3. Sublingual space 4. Submandibular space



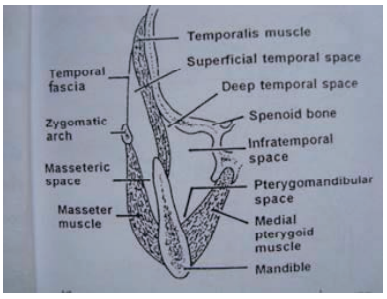
Perforation into the submandibular space

- Often from infection of the second and third molar



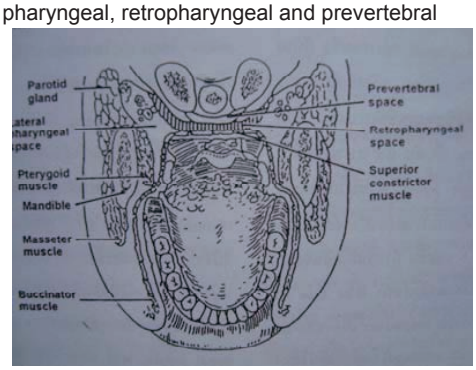
Secondary or masticator spaces: masseteric, pterygomandibular and temporal spaces

- Repartition following the line of insertion of the masseter, temporalis and medial pterygoid mucles on the mandible



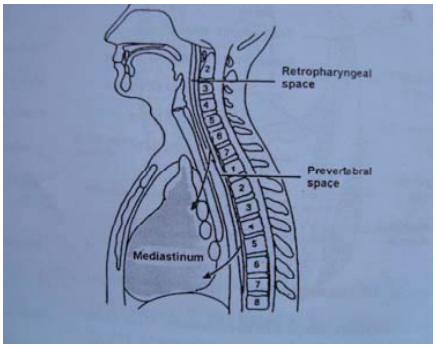
Cervical or deep neck spaces.

- Lateral pharyngeal, retropharyngeal and prevertebral spaces.



Sagittal cut of retropharyngeal and prevertebral space in comparison to mediastinum

- a



Clinical findings: Tschiassny

- Most of cases from second and third molar.
- Perforation at the thinnest place of mandibular lingual surface into submandibular space first than into sublingual space.
- History of dental caries, teeth extraction 2-3 days before, not good dental care, immunosuppressive person, diabetes….
- Swollen above hyoid bone region, red and hard skin in form of cellulitis
- High fever
- Swollen floor of the mouth, elocution trouble, difficult to take breath, can not swallow saliva, stridor….

Special exams

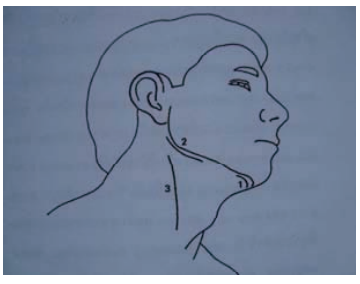
1. Panoramic view of mandible
2. Soft tissue X ray of the neck
3. Contrast-enhanced CT scan
4. Needle aspiration
5. Chest X ray from time to time

Treatment

1. Assessment and support of host defense
2. Maintenance of airway
3. Intravenous high dose antibiotics
4. Surgical drainage and decompression

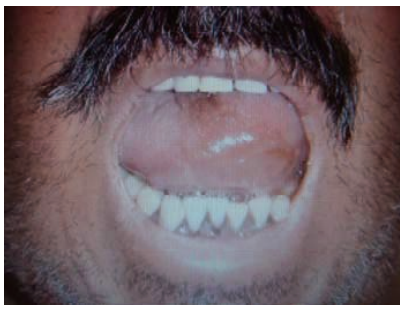
Incision line for :

1. submental space
2. submandibular, sublingual and secondary spaces
3. retropharyngeal and prevertebral spaces



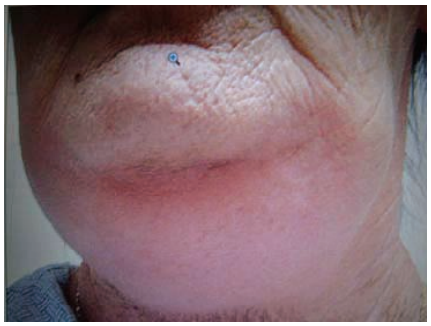
Swollen of the tongue:

- Extension to sublingual space



Cellulites of floor of the mouth

- Extension to submandibular space



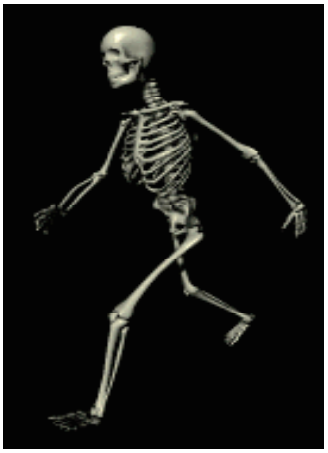
References:

1. Supakorn Rojananin, Ludwig's Angina and odontogenic infection, Head neck and breast surgery vol. 4, Faculty of medicine Siriraj Hospital, 2004
2. Photos: Ludwig' Angina, www:¥www.maricopaemergengymedicin.com¥gallery¥case Image

Maxillary Fracture

Intraການລິ້ງມິດເປີດດ້ານໃນຂອງຜີ້ງ ປາກເພື່ອການປົນປ໋ອ.

By: Dr. Phay DUOANGSY MD.
Specialists Orthopedic Surgery



ຈຸດປະສົ່ງ(Objectives)

ພາຍຫຼັງນັກສຶສາປຣິນຍາໂທ ທັນຕະແພດ ຫັວກ ສູດປ໋ອງກັນ ແລະ ຜ່າຕັດຜ້ີງປາກ ສຳເຫຼັດການ ຮຽນການສອນນີ້ແລ້ວຕ້ອງ:

1. ສາມາດອະທິບາຍໄດ້ ວິທີວິທະຍາຂອງເສັ້ນທາງ ເປີດເຂ້ົາຫາ ຈຸດຕ່າງໆຂອງໃບໜ້າ ແລະ ກະໂຫລກຫົວ.
2. ສາມາດອະທິບາຍໄດ້ກາຍຍະວິພາກສາດຂອງບໍລິ ເວນນັ້ນ ເພື່ອການຜ່າຕັດ.
3. ສາມາດປ້ອງກັນການຕິດເຊ້ືອ,ກອ່ນ ແລະຫັລງ ຜ່າຕັດ,ເຄ້ືງຄັດຕ໋ການ ອະເຊ້ືອ,ປາບເຊ້ືອ.

I. ຍິດນ໋າດ້ານຂອງການເປີດຜ້ີງປາກ

(Introduction)(Surgical procedures in out patient clinic.)

ການເປີດຜ້ີງປາກດ້ານໃນ, ຕ້ອງຕິດຕາມໄປຕາມ ເສັ້ນຂອງ (Gingivobucal sulcus) ສຳລັບເສັ້ນ ທາງໜ້າເຂ້ົາ ຫລ້ືລ້ິງມິດແມ່ນຢູ່ທາງດ້ານໜ້າ ຂອງ
(Anterion surtace) ຂອງກະດູກໃບໜ້າໃນນ້ີມ້ີກະດູກ Maxilla, Zygoma and inferion orbital rims ບາງເທ້ືອລ້ິງມິດທ້ັງ 02 ຟາກກ໋ໍໄດ້ມ້ີດ້ັງຮູບທ້ີ (11)

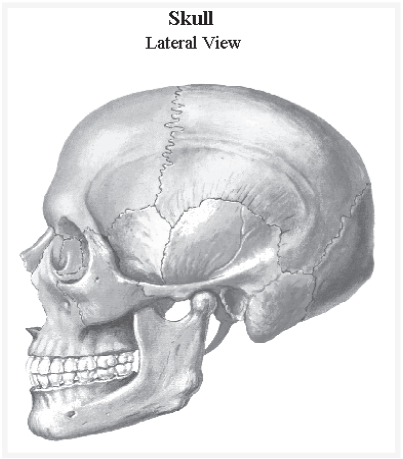
ການຊ້ັກປະຫວ້ັດ (Taking Medical History)

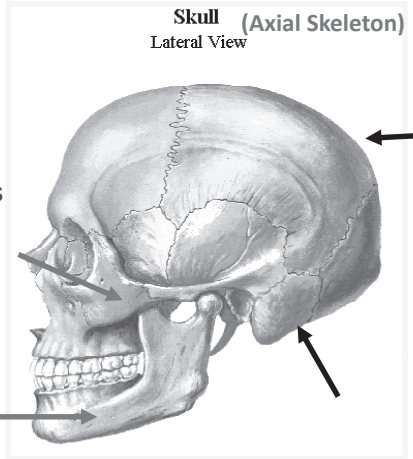
- ທ່ານໝ໋ໍຫລ້ັງປຣິນຍາຕຣີ ຕອ້ງໄດ້ຊ້ັກຖາມ ປະຫວ້ັດ,
- ປະຫ້ັວດສ່ວນຕ໋ົວ,ຄອບຄ໋ົວ,ປະຫ້ັວດປະຈຸບ້ັນ, ຢາທ່ໍ່ໄດ້ຮ້ັບ,ການແພ້ຕ່າງໆ...
- ສະຕ້ິພາຍຫ້ັງການກະທ້ົບ,ການນ໋ໍາສ່ົ່ງ(Refer).
- ການພະຍາບານຂ້ັ້ນຕ໋ົ້ນອ້ື່ນໆ...

ທວນຄ້ືນກາຍວ້ິພາກສາດ.

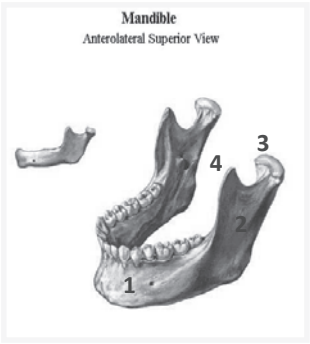
- ຮາງກະດູກໄລ່ແກ້ນກາງ(Axial Skeleton).

1. ຮາງກະດູກຫ໋ົວ(SKUL):ມ້ີຈ໋ໍານວນ:22 ກະດູກ.
   #ຢູ່ເຂດກະໂຫລກຫ໋ົວມ້ີ: 08 ກະດູກ(Bones).
   # ຢູ່ເຂດໃບໜ້າມ້ີ:14 ກະດູກ(Bones).
   # ໃນນ້ີ້ເຫ້ັນຕ້ົ່ງໄດ້:01 ກະດູກ ຄ້ື ກະດູກຄ້າງ ກະໄຕລຸ່່ມ.
   ໝາຍເຫດ:ທຸກກ໋ໍລະນ້ີຂອງກະດູກຄາງກະໄຕ ເທ້ົ່ງ ແລະ ລຸ່່ມຫ້ັກ ແມ່ນໃຫ້ຖ້ືວ່າເປ້ັນການ ຫ້ັກເປ້ີດ. (Open fracture)ຢູ່ສະເໜ້ີ ດ້ັ່ງໜ້ັນທ່ານໝ໋ໍຕອ້ງໄດ້ ເອ້ົາໃຈໃສ່.

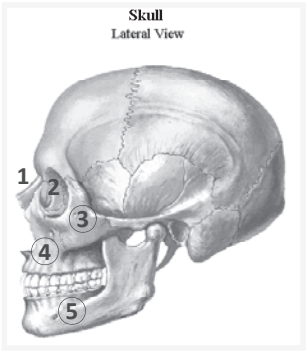




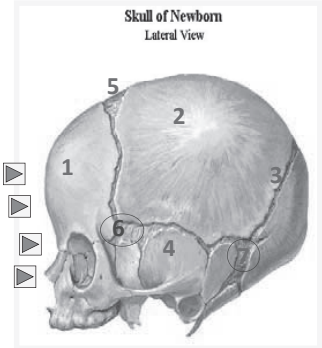
1. Body
2. Ramus
3. Condye
4. Coronoid Process



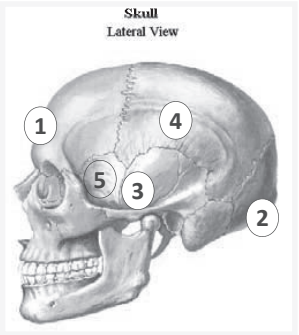
1. Nasal
2. Lacrimal
3. Zygomatic
4. Maxilla
5. Mandible



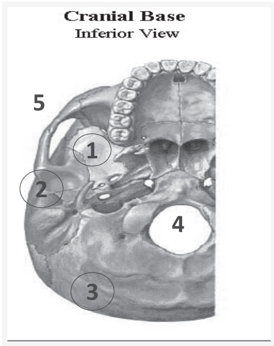
1. Frontal Bone
2. Parietal Bone
3. Occipital Bone
4. Temporal Bone
5. Anterior Fontanel
6. Sphenoid Fontanel
7. Mastoid Fontanel



1. Frontal Bone
2. Occipital Bone
3. Temporal Bone
4. Parietal Bone
5. Sphenoid Bone
6. Ethmoid Bone (Not Shown)



1. Sphenoid Bone
2. Temporal Bone
3. Occipital Bone
4. Foramen Magnum
5. Zygomatic Arch



ການກວດກາຮ່າງກາຍ (Physical Examination) (Extra and Intra Oral Cavity)

ການກວດກາຮ່າງກາຍຄົນເຈັບຕ້ອງໄດ້ປະຕິບັດດັ່ງນີ້.

- ກວດແຕ່ຫົວຫາຕີນ(General Haed to toie).
- ກວດເປັນລະບົບ(MSK).
- ກວດພາຍນອກຜົງປາກ(Extra Oral).
- ກວດພາຍໃນຜົງປາກ(Intra Oral).
- ກວດພາກສ່ວນອ່ອນ(Tisus).
- ກວດລະບົບປະສາດ(Nerves).
- ກວດລະບົບເສັ້ນເລືອດ(Vascular).

ການກວດກາຊ່ວຍໃນການບົ່ງມະຕິກະດູກຫັກ (X-Ray)

ໃນການຂໍລັງສີໃນແຕ່ລະທ່າທີ່ເໝາະສົມກັບປະຫັວດພະຍາດ ແລະການກວດກາ ແຕ່ຕ້ອງປະຢັດແລະໃຫ້ບົ່ງມະຕິໄດ້.

1. X-Ray : The Skull .EX:

- Positioning of the occipital mental rojection (Water')
- Positioning of the posterior- anterior projections (P A Jaws).

ການບົ່ງມະຕິພະຍາດຂອງກະດູກຄ່າງ ກະໂຕເຫິງແລະລຸ່ມ ແຕກຫັກ

Dg: Maxillary Fracture

ການປິ່ນປົວກະດູກຄາງກະໄຕເທິ່ງຫັກ (Protocol of Treatments)

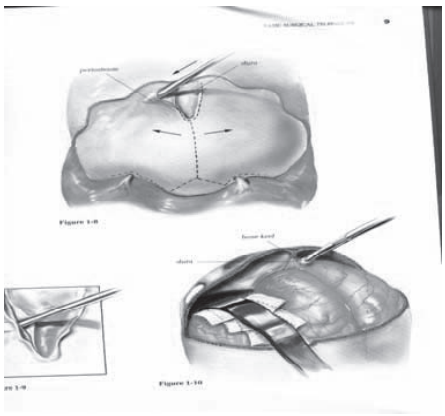
ເບິ່ງຮູບສະແດງ (Photo Record):

1. ການລົງມີດ (Incition).
2. ການຕັດຮອນບາດແຜ (Debrinement).
3. ການລ້າງ (Lavage).
4. ການຄົງທີ (Fixetion).
5. ການໃສ່ທໍ່ລະບາຍ (Drain and Drainage).
6. ການປິດບາດແຜ (Closer Wound).

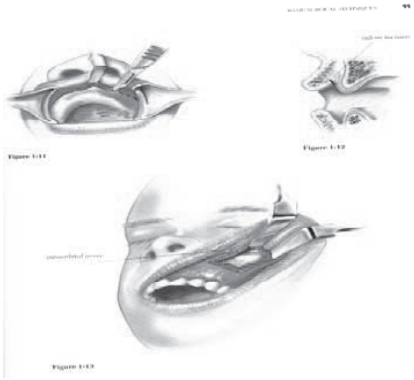
ການສົ່ງຢາ (Anesthesia)

ຕ້ອງໄດ້ໃຫ້ທາງສະລົບທົ່ວໄປ (General Anesthesia)

ຮູບສະແດງ ວິທີການເປີດລົງມີດ **(Photo Record)**



ວິທີການລົງມີດເຂົ້າຫາຜ້ຳປາກ
(Protocol of Treatment line of Incision)



Open Flap and Bone

1. ຖ້າຈຳເປັນໄດ້ເປີດກະດູກ ແລະຕາບກະດູກ ທ່ານໝໍກໍ່ຈະໄດ້ເຮັດດ່ອນ.
2. ຖ້າຈຳເປັນໄດ້ດຶງຈອ້ງໄອ້ກໍ່ຕ້ອງໄດ້ເຮັດໄອ້ທັ້ງ ໝົດ ຫຼືລຈອ່ງເປັນພາກສ່ວນ.
3. ບ່າງຄັ້ງອາດຈະໄດ້ປິດບາດແຜຂອງເຫິກແລະ ແຂ້ວ.
4. ໝໍ່ຕ້ອງບໍ່ລືມໃຫ້ຢາ:-ແກ່ປວດ,ຕ້ານເຊື້ອ,ຢາ ປ້ອງກັນແຜທະຍັດ.
5. ນັດມາພົບທ່ານໝໍ່ຄືນໃນ02ມື້ຕໍ່ໄປ.

- ໃນນີ້ຄວນລະວັງເສັ້ນປະສາດສອງເສັ້ນຄູ່ຢູ່ລຸ່ມກະ ໂບກຕາ (Infraorbital neck).
- ສາມາດລົງມີດແບບ9 Bifocal incision) ສາມາດຍະ ຈິ່ວະອ່ອນດ້ວຍເຫ ືອກດຶງ, ເພື່ອຕັດ ຫລືເຮັດການ ສ້ອມແປງກະດູກ.

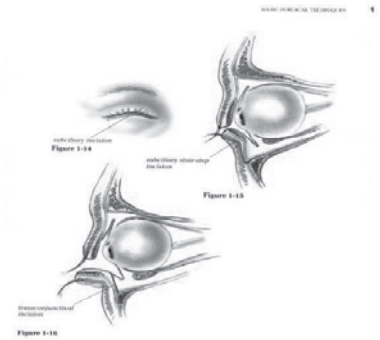
II. ວິທີການລົງມີດເປີດວົງຂອບຕາ Exposure of the orbit

- ເພີ່ນນຳໃຊ້ໃນການວົງມີດໄປຕາມ Acass to the floor of the orbit.
- ເຂົ້ຳຊັ້ນໜັງ ແລະຊັ້ນລຶບໜັງຕາມຮູບສະແດງໄປຕາມຂັ້ນຕອນ (The stains - step incision) ເພື່ອໃຊ້ໃນການເປີດເຂົ້ຳຫາ 1,14, 1,15, 1,16.

III. ວິທີເປີດຄາງກະໄຕດ້ານລຸ່ມ (Intra oral exposure of the Ascending Ramus)

- ການລົງມີດໄປທາງດ້ານຂ້າງຫາດ້ານຫລັງຂອງຜິ້ງ ປາກໄປຕາມລອງຂອງ (Colorado needle) ນຳ ໃຊ້ມີດໄຟຟ້າດູດເລືອດ, ຮ່ວມຜ່າຕັດສາມາດຜ່ານ ໄປຮອດ Border ຂອງ Ascending Ram us ໄດ້.

ຮູບສະແດງການເປີດ ແລະປິດ ຂອບເຂດ ກະໂບກຕາ



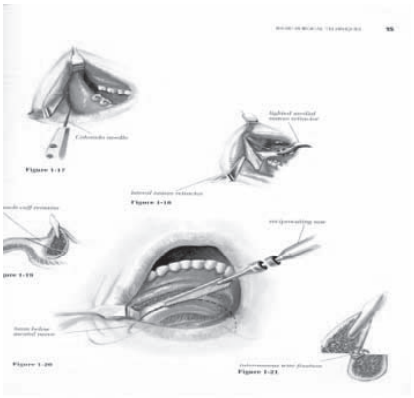
IV. ການລົງມີດເປີດເຂົ້າຫາຄາງກະໄຕລຸ່ມ Exposure of the chin

- ການລົງມີດສຳລັບຜ່າຕັດຄາງກະໄຕລຸ່ມຜ່ານ 02 ຊັ້ນ (layer offer surgery).
- ການລົງມີດຕ້ອງໃຫ້ຮອດຊັ້ນກະດູກ.
- ຕ້ອງໄດ້ລະວັງເສັ້ນປະສາດຄູ່ທີ່ມີຊື່ວ່າ: Sub mental Nerse ທີ່ມັນລອດຮູມານີ.

Surgical Pocedures in Hospitalization

- Mandible fractures(11 cases in 2008-2009 by traffics accident at SETHA THY RATH HOSPITAL.
- Maxilla Fractures:02 Cases Le Fort: I , II.
- Refer to Mittaphap Hospital:13 Cases.
- Total:13 Cases.

ຮູບການສະແດງວິທີການລົງມີດ

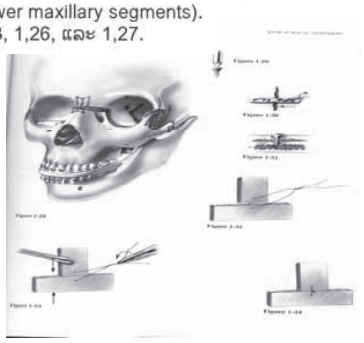


V. ວິທີການຍຶດຈ່ອງສຳລັບຄາງກະໄຕເທິງ ຫັກແບບເລີ່ມອດ I Fixation Technigual le fort I Aduancement

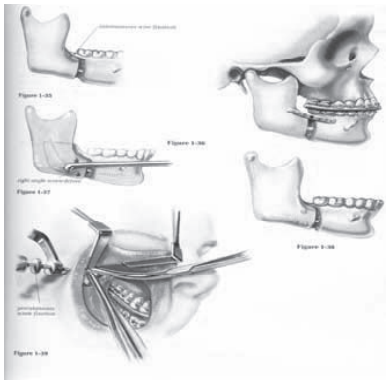
ເພີ່ນນຳໃຊ້ລະບົບ (C.M.S system ຫລືເຮັດເປັນຮູບ saped ມັດດ້ວຍ Were Steles stall ເພື່ອຈັດໃຫ້ມັນແໜ້ນຢູ່ດ້ານໃນ.

VI. ການຫັກແບບ Le fort I with sliding Geniaplasty Advancement and elonoation

ການຫັກຢູ່ (Lower maxillary segments).
ເບິ່ງຮູບ :1,23, 1,26, ແລະ 1,27.



ກະດູກ ຫັກແບບເລີຟອດ 3.
VII. Fx ແບບ Lefort III



ຂໍ້ມູນອ່າງອີ່ງ (References)

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  Lippincott--Raven ຂອງທ່ານ: KENNTH E. et ທ່ານ:SALYER.
- ເອົາແຕ່ຮູບ.
- ຈາກບົດສອນຂອງວິຊາຜ່າຕັດ ຕົບແຕ່ງໃບໜ້າ ຂອງ ມ ຊ ຊຽງໃໝ່.(University Chiang Mai,Thailand).

Zygomatic fractures

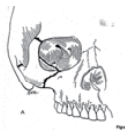
Dr Khamsing Sypraseuth
ENT Departement
Mittaphab Hospital
December 2009

Epidemiology

- Second most common fractures of the facial bones.
- 20 cases per year at Mittaphab hospital.
- Age: 15-30 years 75%.
- Male: 80%
- Vientiane capital: 61%
- 98% from traffic accident

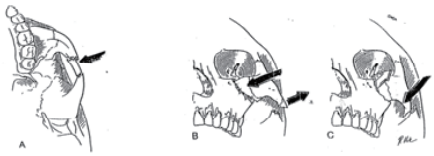
Anatomy

- The zygoma forms a highly visible portion of the midfacial contour.
- It is this very prominent position that contributes to its high frequency of fracture.
- The zygoma has four articulations : frontal, maxillary, and temporal bones (zygomatic process) and the greater wing of the sphenoid.
-



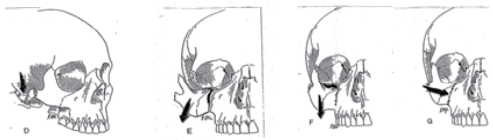
Classification of the fractures

- Rowe and William (1985) have classified zygomatic fractures into two major groups based on the anatomy as demonstrated by the upright Waters and submentovertex radiographs.
- *Group 1 fractures* are usually stable after elevation. These include fractures of the arch only (medial displacement) (Fig. A) and medial and lateral rotation around the vertical axis (Fig. B and C).



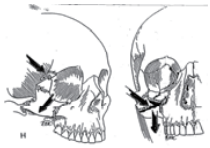
Classification of the fractures

- *Group 2 fractures* often remain unstable after elevation. These include fracture of the arch only (inferior displacement)(Fig. D) ; medial and lateral rotations around horizontal axis(Fig.E); inferior, medial, and posterolateral dislocation en bloc (Fig. F and G); and comminuted(Fig. H and I)



Classification of the fractures

- *Group 2 fractures :* comminuted



Physical examination

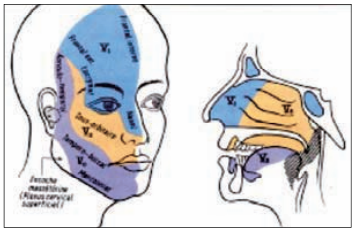
- The most common findings with zygomatic complex fracture include the followings:
- Periorbital ecchymosis
- Subconjuntival ecchymosis
- Depression of the malar prominence
- Depression and step deformity of the infraorbital rim
- Tenderness or step deformity at the frontozygomatic suture
- Paresthesia¥anethesia of the infraorbital nerve and ¥ or zygomaticofacial and zygomaticotemporal nerves.

Physical examination

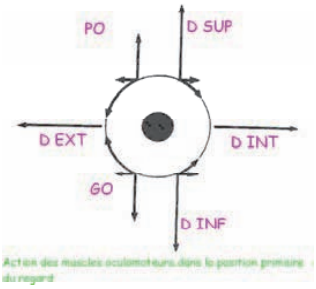
- Other findings may include the following:
- Enophtalmos or proptosis
- Diplopia
- Decreased range of extraocular motion, particulary in upward gaze
- Injury of the globe
- Limitation of the mandibular movement (impingement of the zygomatic arch against the coronoid process)
- Surgical emphysema
- Canthal ligament disruption (medial or lateral) with traumatic telecanthus

Cranial Nerve Examination

- CN II, III, IV, V, VI and VII.
- Innervation of CN V

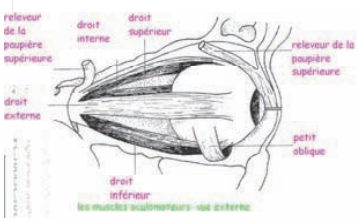


Cranial Nerve Examination: action of oculomotor muscles



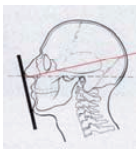
Cranial nerve examination

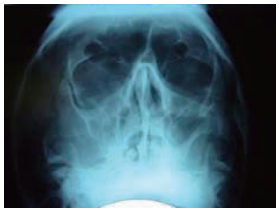
- NC III for superior rectus, internal rectus, inferior rectus, levator of upper eyelied and inferior obliqus.
- NC IV for superior obliqus muscle
- CN VI for external rectus muscle

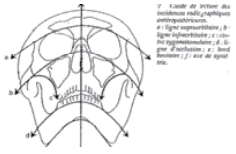


Radiographs: Blondeau View

- Nose chin plate

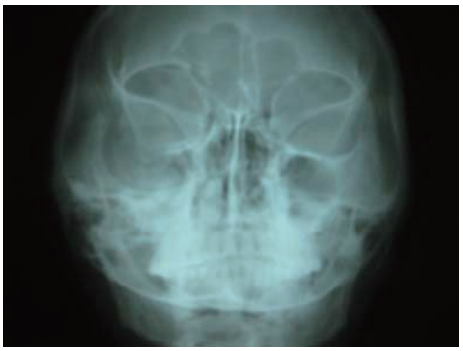






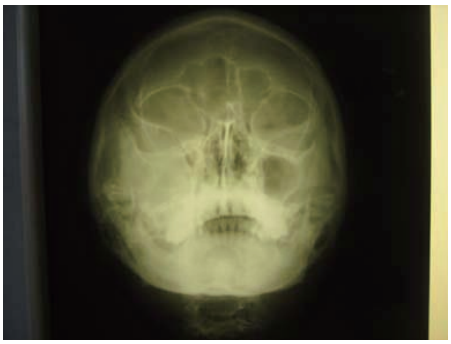
Radiographs.

- Blondeau view: pat 30 y F Fract. of right zygoma



Radiographs.

- Blondeau view: patient 30y F Fract. of right zygoma treated (contention) with 2 wirings.

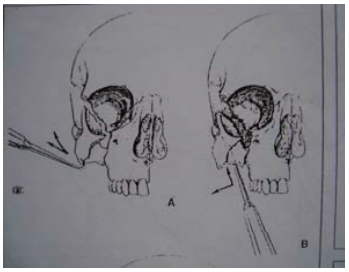


Indications for surgery

- The major reasons for considering surgical reduction are:
  1. alteration in facial contour
  2. globe displacement (enophtalmos, exophtalmos)
  3. Muscle and ¥ or nerve entrapment
  4. Mechanical restriction of mandibular movement from impingement on the coronoid process
  - Ideally surgery should performed before significant swelling has occurred or after most swelling has resolved (7 to14 days).

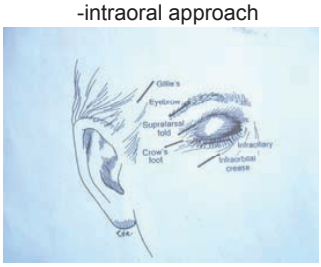
Indications for surgery: closed reduction

- Reserved for simple displacements that no need fixation after reduction using Ginestet hook



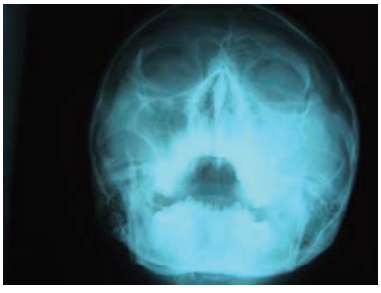
Indications for surgery: open reduction

- approaches: -eyebrow
  -infraciliary
  -old wound (sometimes)
  -intraoral approach



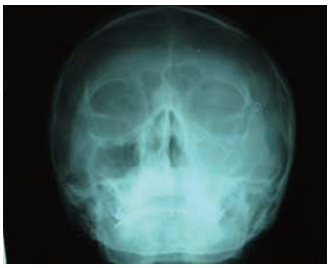
Surgery: eyebrow open reduction

- Pat. 24 M Left frontozygoma fracture



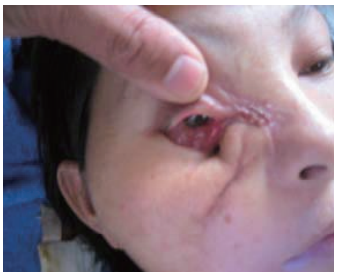
Surgery: open reduction

- Wiring by Eyebrow approach
- Intermaxillar bloc



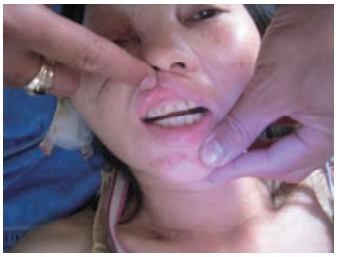
as

- old wound



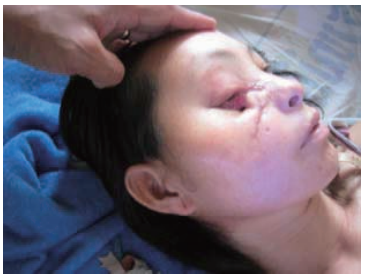
as

- Can not open the mount

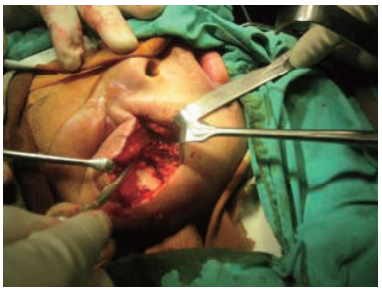


as

- can not en the eye



Open by old wound



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- Fracture du malaire cours du Pof Isabelle Barthelemy
- Traumatologie:Cours Dr pierre Revol

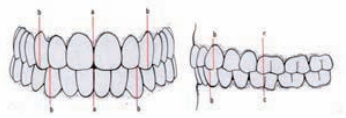
Mandibular fracture

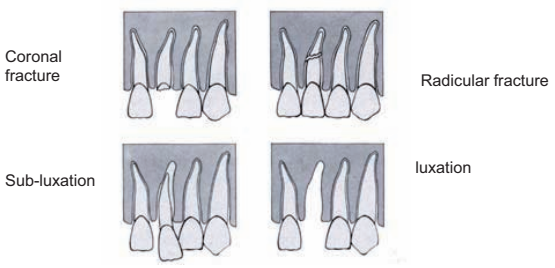
Khamsing Sypraseuth M.D.
ENT Department
Mittaphab Hospital Vientiane
19 February 2010

Ethiopathogeny

- -60% of face fractures at Mittaphab Hospital (2008)
- -Almost of them from traffic accident
- -Advanced position between the face and the neck, the mandible is very exposed to the traumatism
- -Two mechanisms: Fracture take place at the point of impact and at distance of point of impact
- -Displacements: decalage, chevauchement, torsion and angulation

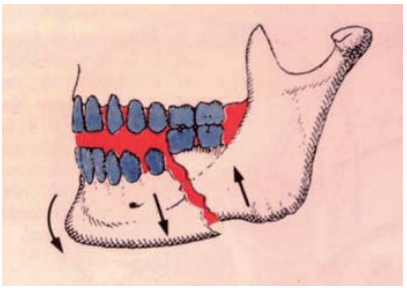
Normal occlusion

- 



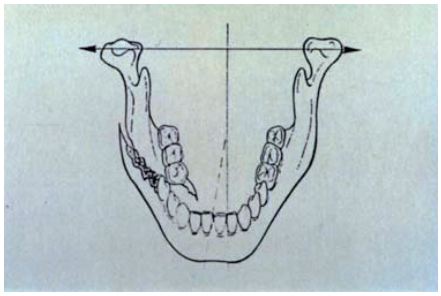
Decalage: steps of stairs

- Gape with ascension of posterior segment (vertical plane)



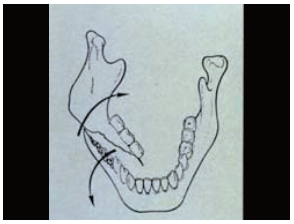
Chevauchement: shortening of mandibular arch

- Displacement of incisive point (horizontal plane)



Torsion or rotation: displacement fragments in contrary direction

- Divergence of occlusion faces of the fractured fragments



Taking medical history and physical examination

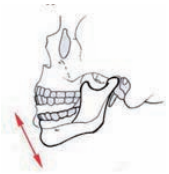
- Date, time and circumstances of accident (nature, point of impact, direction, energy)
- Pain, limitation of mandibular movement, old history of malocclusion, prothese, respiration, hemorrhage
- Trouble of elocution, deglutition
- Alcoholism, cardiopathy, respiratory insufficiency
- Exam of denture
- Abnormality of occlusion
- Movement of closing and opening the mouth
- Palpation of alveolar ridge

Physical examination

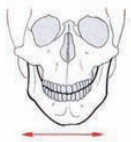
- congealed face, gape
- Lesions of soft tissue
- Hemorrhage (wound, external ear canal)
- Skeletal deformation (latero-deviation of the chin)
- Palpation of basilar ridge (steps of stairs, pain)
- Antero-posterior pressure (for the few displacement of angle or condyl fractures)
- Lateral pressure awakening pain of symphyse
- Palpation of condyle

Physical examination

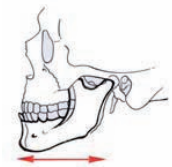
- Close-open



diduction

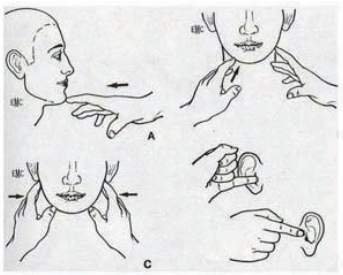


- Propulsion and Retropulsion

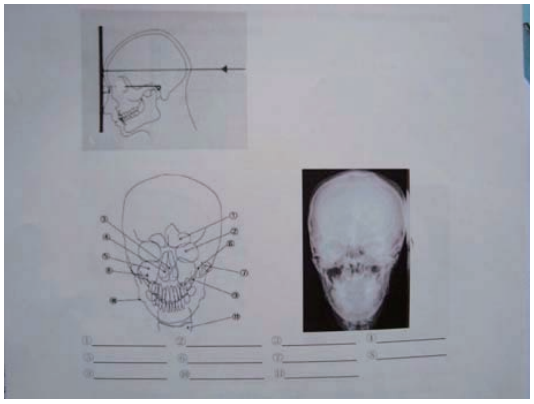


Physical examinaton

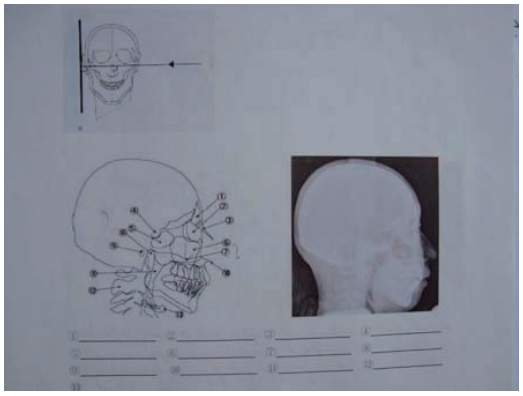
- Antero-posterior pressure on the chin, awakening preauricular pain in case of condylar fracture
- Palpation basilar ridge to search point of pain, abnormal mobility of teeth or dental arch.



Positioning of postero-anterior projection: PA

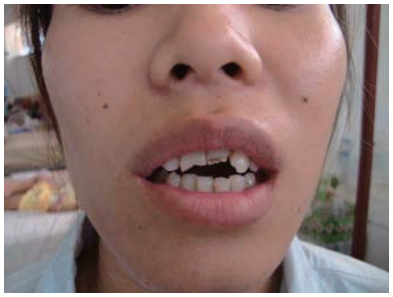


Positioning on the lateral projection:



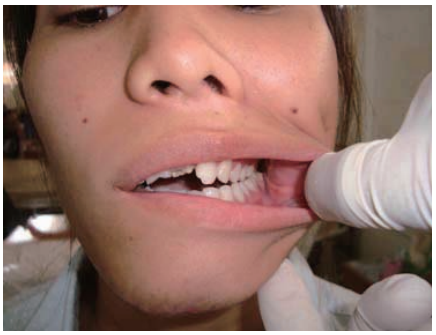
Pat. A 20y F :fracture of symphyse and left condyl

- Anterior gape and pain left TMJ



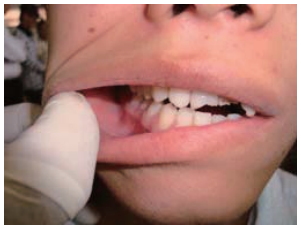
Pat. A 20 y F fracture of symphyse and left condyl

- Premature contact molar left
- Point of impact on the chin and lateral left



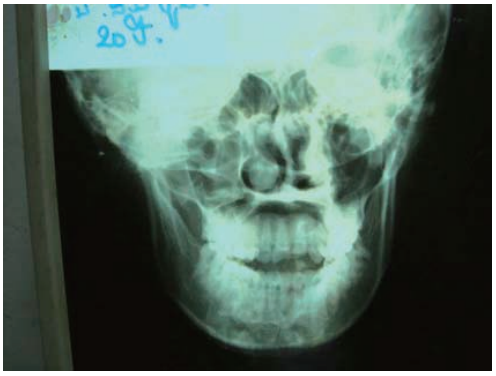
Pat. A 20y F :fracture of symphyse and left condyl

- Premature Contact molar left



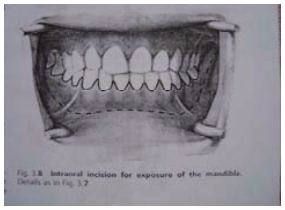
Radiograph: positioning of the antero-posterior projection

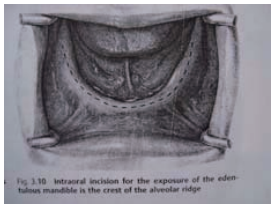
- fracture of symphyse and left condyl



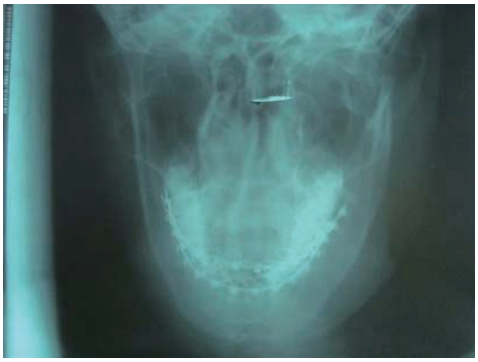
Treatment: incision

- Incision in the unattached mucosa 5-10 mm below the attached gingiva . The marginal rim incision can be used. Intraoral incision of the edentulous mandible is the crest of the alveolar ridge.





X-Ray control the day of operation: two wirings in the chin for contention

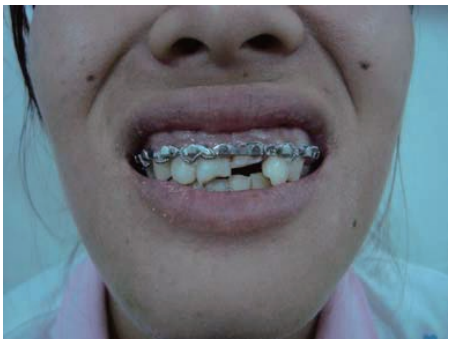


Pat. A 20y F :fracture of symphyse and left condyl

- Two weeks after operation: exercise to open the mouth.

Pat. A 20y F :fracture of symphyse and left condyl

- Good occlusion after two weeks block.



Thank you for your attention

- References:

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-Maxime Champy and Patrick Blez. Anatomical aspect and Biomechanical Consideretions. Atlas of Craniomaxillofacial Osteosynthesis. 1999

-Pr.Isabelle Barthelemy. Fracture de la mandibule. 2004

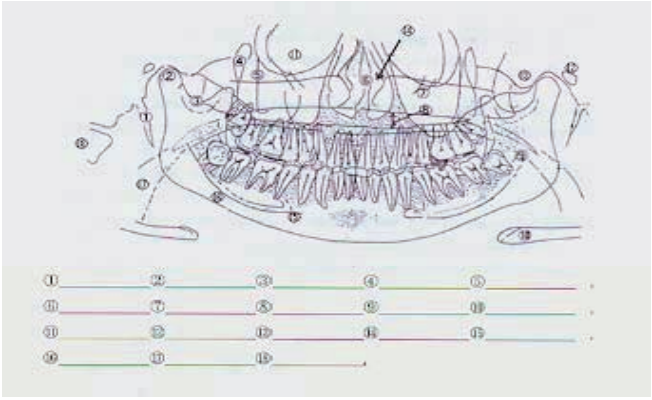
-R.Cola+F.Cheynet. Fracture de la mandibule. Stomatologie.

Radiographic Technique in Oral and Maxillofacial Radiologique And Case Study for the oral and Maxillofacial Surgery.

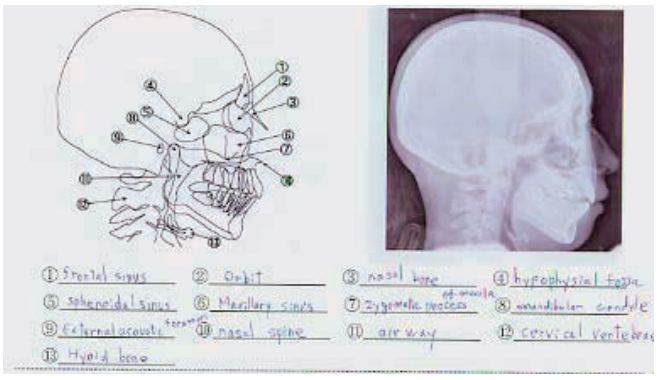
By: Dr. Phay DOUANG SY. MD,
Orthopedic Surgery.

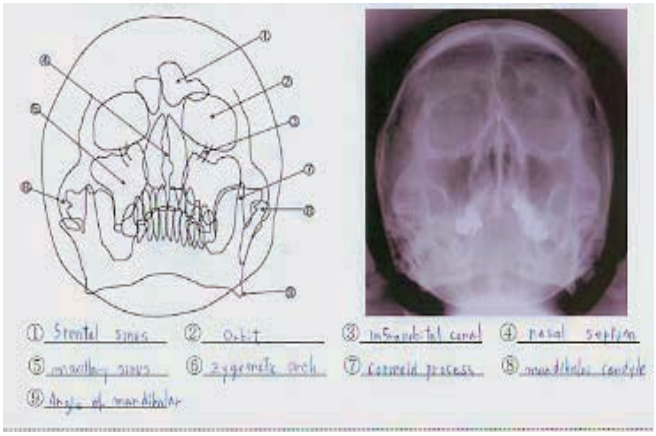
ສາລະບານ (Contents)

Case Study for the Oral and Maxillofacial Surgery.



ທວນຄືນກາຍຍະວິພາກສາດທາງດ້ານລັງສີ Anatomy Imaging.



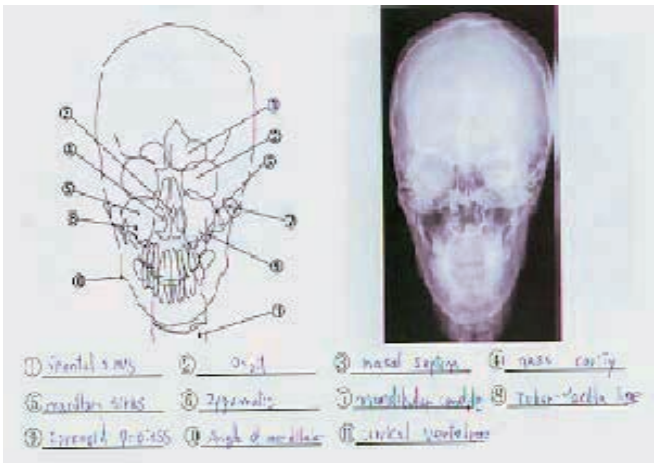


ລະອຽດ:

1. Panoramic Tomography also refurred to as ortho pantomography (OPG).

. ຫລັກການຂອງການຮູບລັງສີ (Method).

1. ບອກຄົນເຈັບເອົາວັດຖຸທີ່ກັນແສງອອກ.
2. ອະທິບາຍໃຫ້ຄົນເຈັບເຂົ້າໃຈໃນການສັງເກດ.
3. ຫ້າມໃຊ້ການປ້ອງກັນຕ່າງໆເພາະມັນຈະບັງຮູບ.
4. ຂໍຮ້ອງກັບຄົນເຈັບໃຫ້ຄວາມຮ່ວມໄມ້ຮ່ວມມືທີ່ທ່ານໝໍຈັດທ່າໃນການຖ່າຍທຳ.
5. ກວດຄືນຕາມຂໍ້ຊີ້ນຳຂອງ (Rosita EC.panexm adine).
6. ນຳໃຊ້ສ່ອງລັງສີ X ປະມານ 70 - 80 KV and 6-10 mA.



. ວິທີການຖ່າຍພາບລັງສີ (Oblique lateral viruses).

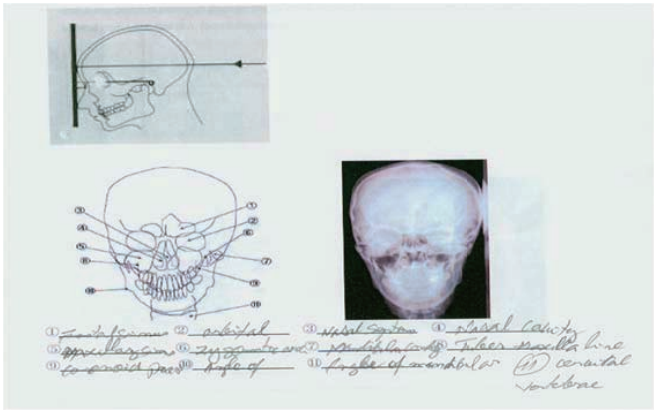
- ເພີ່ນໃຊ້ແສງ X - Ray dental.
- ເພີ່ນໃຊ້ລັງສີສຳລັບ Maxillary and mandibles molar and canine regions.

ແມ່ນການຢາກເບິ່ງບໍລິເວນແຂ້ວ Molar ແລະcanine.

ພັກການ (Method)

1. ໃຫ້ຄົນເຈັບນັ່ງເບິ່ງຕັ່ງ, ປິ່ນຫົວທັງ 02 ຂ້າງແສງໃຫ້ຜ່ານ (The radiographic keyhole) ຕ້ອງໄດ້ຂະຫຍາຍອອກ.
2. ໃຊ້ Cassettes is held by the patient against the side of the face ensuring the cassette oiliest the area under investigation.

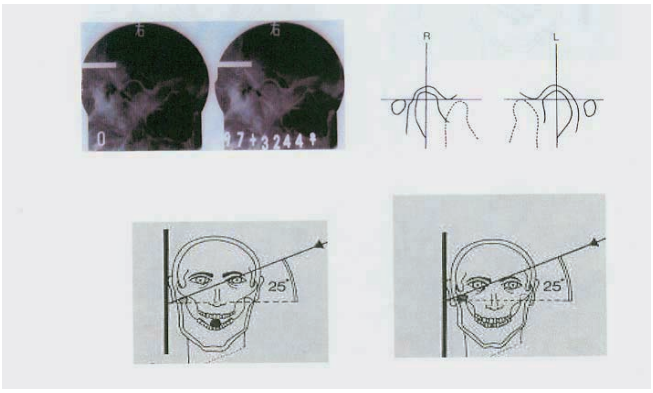
ກາຍະວິພາກສາດຂອງຮູບພາບລັງສີ



3. Aim the X- Ray beam at the maxillary and mandible teeth to be investigated though this (keyhole) , positioning the x – Ray tube along the line of the occlusal plane , just belie ear.
4. Change the direction of the x-ray beam to sait the area to be investigated (See the illustration).

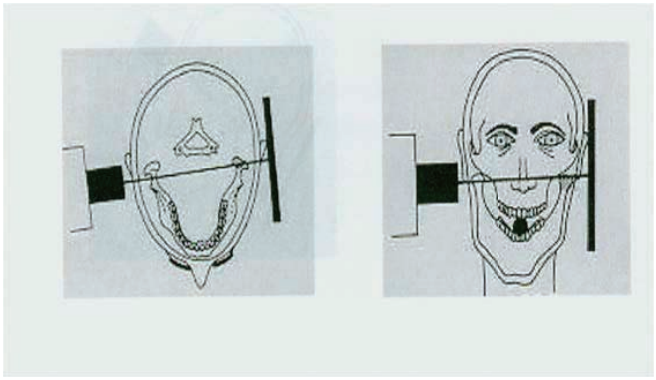
ຖ່າຍເບິ່ງ (Premolar)

ການຖ່າຍຮູບພາບລັງສີ25ອົງສາຫາ (TMG)



ການຈັດທ່າ (Positioning of the Occipitomental projection water's) ຮູບລັງສີທ່ານີ້ ແມ່ນເບິ່ງການສະແດງຂອງຮ່າງກະດູກ (Skeleton and the maxillary sinus) ແລະເຫັນກະດູກພື້ນ ກະດູກຫົວ ແລະກະໂພກ.

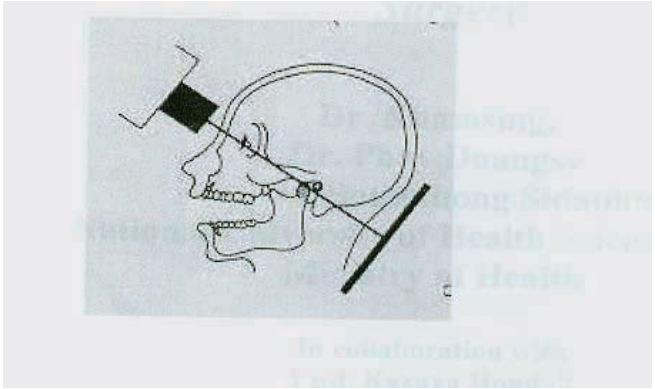
ຮູບລັງສີທີ່ແສງຕັດຜ່ານ.



ຫລັກການ Method:

1. Identify the radiographic baseline on the patient's head (see illus traction).
2. Position the patient (standing) facing the film.
3. Tip back the head so that the radilo graphic baseline is at 45 to the film (So called nose chin position) this would drop the thief bones of the skull downwards and raises the facial bones.
4. Position the x- Ray tube head and aiming the central ray of the x - Ray beam horizontally through the occipital.

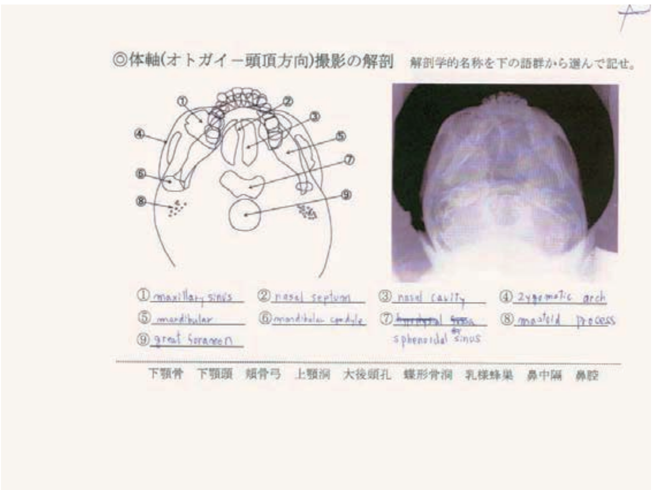
ແສງຜ່ານກະໂບກຕາ.



ການຈັດທ່າລັງສີຫລັງ-ໜ້າຂອງແສງ Positioning of the Postero anterior projection (PA).

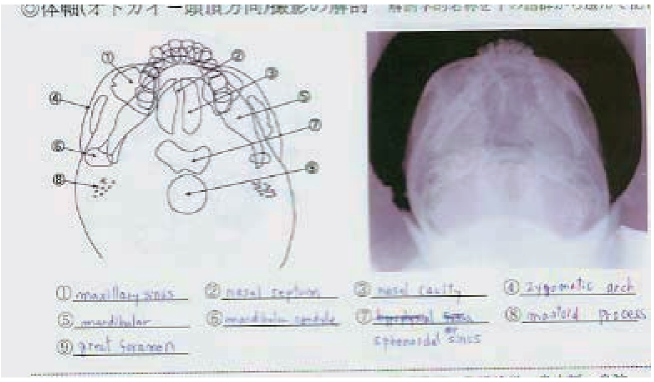
ຫລັກການ (Method)

1. Identify the radiographic baseline on the patient's head (See illustration).
2. The patent is positioned facing the film with the radiographic baseline horizontal (standing) in the so called forehead nose position.
3. The x - Ray beam is directed with the Central ray passing though the occupy in a horizontal direction (Resale to the radiographic baseline) see illustration.



ການຈັດທ່າຖ່າຍຮູບລັງສີດ້ານຂ້າງ
Positioning of the lateral Projection

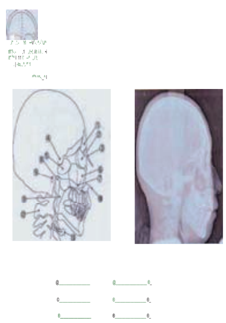
1. ແມ່ນການຖາຍຮູບພາບລັງສີກະດູກຫົວ ແລະ ໃບໜ້າຂອງ (Venue cephalometric lateral skull)
2. ຫລັກການ Method ການຈັດທ່າຄົນເຈັບ
   1. Position the patient with the side of the face founding the film, turning the head through 90; this will bring the sagiltal plane of the head parallel to the film.
3. The x - Ray beam is centered through the external Auditory meats, horizontally and at 90 to the sagihal plane and the film (See illustrations)



ຮູບສະແດງ:

1. ເສັ້ນທາງຂອງແສງຜ່ານທາພິມຮູບ.
2.ຜົນຂອງຮູບລັງສີທີ່ໄດ້ທາງກຣີນິກຂອງ
 ກາຍະວິພາກສາດປົກກະຕິຫລືເປັນພະຍາດ.

ຮູບລັງສີທ່າຂ້າງ



ການຈັດທ່າຖ່າຍຮູບລັງສີຫົວ
ແລະໃບໜ້າສ່ວນຂອງທ່າຮູບຄາງກະໄຕ
Positioning of the submentovertical projection

- ເພື່ອເບິ່ງກະດູກ (Exposure factors if detection of zyyomatic arch factues is required).
- ມີຫລັກການ Method
  1. The patient is positioned facing way from the film.
  2. The head is tip red backwards as far as possible so that the radiographic baseline is vertical and the vertex of the skull touches the film.
  3. Aim the x - Ray beam from becloud the chin at 5 becloud the Horizontal centering it through the upper and teeth Laura (molar) ຢາກເບິ່ງແຂ້ວເທິງ ແລະລຸມ).
  a line comectiong which will be horizontal ? In the above poaition (See illustration).

ภาพถ่ายรูบลังสีท่าขอๆ (The T.M.J projection)

ภาพจัดท่าถ่ายรูบลังสี หลักภาพ Method

1. The head is positioned with the sagittal plane vertical and parallel to the film with the T.M.J under investigation toucding the film (or in the C am on the same side as close as possible with the madine) on the occasion the mouth is kept dosed.
2. Position the x - Ray tube head aiming dowenueards at 25 a above horizontal across the cranium centering on the T.M.J under investigation in one variation of the procedure the tube head is shifted posterior at 5 to the vertical plane.

3. Repeat the procedure with the mouth open as far is comfortable a bite - bloc can give sterility .
4. The procedure may be repeated for the opposite.

ຮູບຖາຍແສງລັງສີຜ່ານ.

ภาพจัดท่าส่องไฟฟ้าที่ผ่าน Tran pharyngeal projection

- สำลับท่านี้แม่นสามาด (Taken with the dental x - Ray set and extra – oral cassette
- มิหลักภาพ Method

1. The cassette is held the patient against the side of interest with head and film parallel and vertical.
2. Patient's mouth is open and stabilized with a bite block.
3. The central x - Ray is directed slightly posterior, through the sigmoid match and across the pharynx at the condoyle under investigation.

4. Repeat with the opposite T.M.J for comparison.

ຮູບສะแดๆ

1. แสๆ X ผ่านหา film พ้อมอ่านผิน.

ภาพจัดท่าถ่ายรูบผ่านเป้าภะโบกตา (Positioning of the trams orbital projection)

- This view also can be taken with the dental x – Ray set and extra cal cassette.
- หลักภาพ Method

1. The cassette is held by the patient behind the oar on the side of T.M.J under investigation.
2. The mouth is kept open with a bite block for stability.
3. Position the x - Ray tube near inner can thus of the opposite eye aiming downward through the orbit at the condoyle under investigation.

ຮูบสะแดๆ: แสๆผ่านภะโบกตา.

The End

ລະບົບກະດູກ-ກ້າມຊີ້ນໃນບ ັນຫາຄ ່ າງ
ກະໄຕລ ູ ້ ມມ ີ ບ ັ ນຫາ
(T.M.J.Joint)
Muscular-skeletal History and Physical Examination

Dr. Phay DOUANG SY.
MD,Graduate Diploma In Clinical Sceinces
(Surgery octhopedicand Palastic Sugery)
Course coordinator.
Faculty of Dentis University of Heal Sceince.

ວິຕາມິນ(Vitamines) A and C.

- A: Acceptance(ຍອມຮັບຊຶ່ງກັນແລະກັນ).
- A; Affection(ຮັກບໍ່ມີວັນສະລາຍ).
- A : Appreciation(ຮູ້ຈັກບູນຄູນຊຶ່ງກັນແລະກັນ).
- C :Commitment(ຮັກສາຄວາມໝັ້ນສັນຍາ).
- C: Care(ເບິ່ງແຍງຊຶ່ງກັນແລະກັນ).
- C: Communication(ໂອລົມຊຶ່ງກັນແລະກັນ).

ຈຸດປະສົງ(Objectives).

- ພາຍຫລັງນັກສຶກສາສຳເລດການຮຽນການສອນບົດນີ້ແລ້ວ ສາມາດ:
- ຊັກຖາມປະຫັວດພະຍາດຂອງຄົນເຈັບກ່ຽວກັບລະບົບກະແຂ ້ ວຄາງໜ ້ າໄດ ້ .
- ສາມາດຈັດທ່າແລະກວດກາຄົນເຈັບລະບົບແຂ ້ ວຄາງໜ ້ າຂອງກະດ ູ ກແລະກ້າມຊີ້ນໄດ້ຢ່າງຖືກຕ້ອງ.
- ສາມາດເຂົ້າຫາຄົນເຈັບໄດ້ຢ່າງຖືກຕອ້ງແລະຖືກຕອ້ງຕາມຈັນຍັນຂອງແພດ(Medical Ethtic)ແລະວ ັ ດທະນາທຳລາວ(Culture).

ການຊັກຖາມປະຫັວດ.
MSK History

- ຊັກຖາມປະຫັວດພະຍາດ(History of Present Illness).
  - ເຈັບຢູ່ບອ່ນໃດ (Where is the pain).
  - ເຈັບເວລາໃດ(When does the pain occur (Especially at night in bed deep bone pain – think cancer)
  - What kind of pain is it?
  - Aggravate- what makes it worse?
  - Alleviate – what makes it better?
  - Associate: …

ອາການສົມທົບ-ກັບຄໍ່ T M J.
Associated symptoms- JointsTMJ

- Red (Erythema)ມີອາການແດງບໍ?
- Hot(ມີອາການ ຮອ້ນບໍ?.)
- Swollen or inflamed (ມີອາການເສັ້ງໜ້າທີ່ການບໍ?.
- Tender to touch(ມ້ອາການແຂງເວລາຈັບບາຍ)

ການກວດກາ(P.Examination)ທີ່ມີອາການຮອມ
Associated Systemic Symptoms

- Eye pain (Iritis)
- Skin rashes (Lupus, other systemic inflammatory diseases)
- Bowel problems (Inflammatory Bowel Disease)

Physical Examination Outline Extra and Intra Oral cavity.

- Inspection
- Palpation
- ROM(T M J Joint)
- Neurovascular
- Stability
- Special Tests(ຖ້າມີຕ້ອງໄດ້ກວດ)

Musculoskeletal Examination

- Think about the joints above and below
- Compare to normal side ຂອງຄໍ່ຕ່ (TMJ Joint)

Inspection

- Strip them
- Gross deformity
- Skin
- Atrophy/hypertrophy
- Symmetry/Asymmetry(ຖ້າມີ)

Palpation

- ຄໍາສະເພາະຄໍ່ຕ່ຄ່າງກະໄຕແບບທ່ໍ່ວໄປ.
- ຄໍາແບບພິເສດ (Be specific)

Range of Motion

- ການເຫັ້ງຕົ້ງແບບ
  (Active Range of Motion)
- ການເຫັ້ງຕົ້ງແບບ
  (Passive Range of Motion)
- ຢູ່ໃນຄໍ່ມີສຽງ(Crepitus)ບໍ່?

Neurovascular Examinaton

- Pulses
- Capillary refill
- Sensation
- Reflexes
- Motor
- Coordination

Sensation

- Subjective vs Objective decrease
- Peripheral nerve vs more central distribution
- Types of sensation
  - light touch
  - sharp
  - proprioception
  - 2 pt discrimination

Reflexes

- Get patient to relax
- Grading
  - 0 :none
  - 1 :diminished from average
  - 2 :average
  - 3 :increased
  - 4 :markedly increased
- Symmetry
- Abnormal reflexes

Motor strength

- Grading
  - 0 - no movement
  - 1 - trace
  - 2 - movement without gravity
  - 3 - movement with gravity
  - 4 - not normal
  - 5 - normal strength

Stability

- Provocative testing
- Patient guarding

Special Tests

- Many tests
- History and previous part of your exam guides you to specific tests

Terms

- Flexion / Extension
- Occlusion thoot

X-Ray

ຂໍ່ໃນທ່າ(T M J)

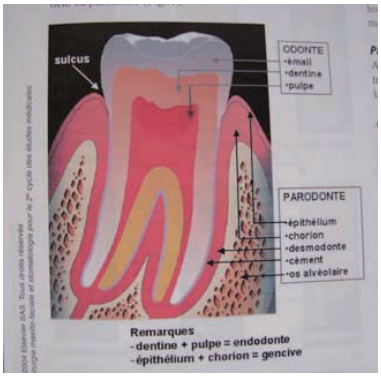
#ເບິ່ງຮູບສະແດງ(Pho record).
#ການບ່ງມະຕິທາງດ້ານກຣີນິກ(Clinical Diagnosis).
#ວິທີການປິ່ນປົວ(Protocol of treatment).
#ການໃຫ້ຢາສະລົບທົ່ວໄ(GeneralAnesthesia).
#ຈຳເປັນຕ້ອງໄດ້ຜ່າຕັດເປີດ(Open flap).
#ຕ້ອງໄດ້ດຶ່ງເຂົ້າທີ່(Reduction).
ສຳລັດ ແລ້ວຕ້ອງໄດ້ຫຍິບປິດບາດ(Suture).
ຈຳເປັນຕອ້ງໄດ້ໃຫ້ຢາ(Prescrition).
#ນັດຄົນເຈັບມາພົບແພດ(Follow up)
ຕ້ອງໄດ້ພຶກແອບຄ່ຽງກະໄຕ(Rehabilitation).

Radicular Cyst.

.Khamsing Sypraseuth M.D.
E NT Department
Mittaphab Hospital
Vientiane
February 2010

Anatomy of Dental Organ

1. Donte:
   -email
   -dentine
   -pulpe
2. Parodonte:
   -gengive
   -desmodonte
   -cement
   -alveolar bone



Radicular cyst: Pathogenesis

- Two ways of propagation:
  - Endodontic route: Carie email
    Carie dentine
    Pulpitis
    Parodontitis apical
    Infectious complication
  - Parodontal route: Parodontopathy
    Necrosis pulpar
    Infectious complication

Propagation of dental infection

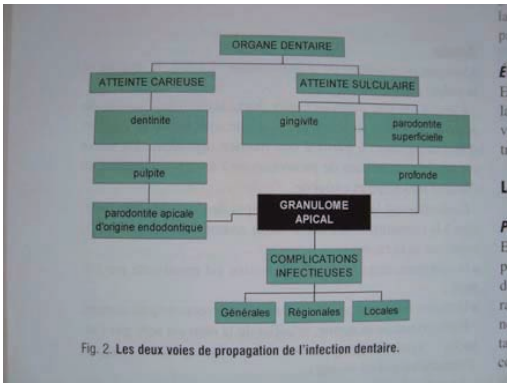
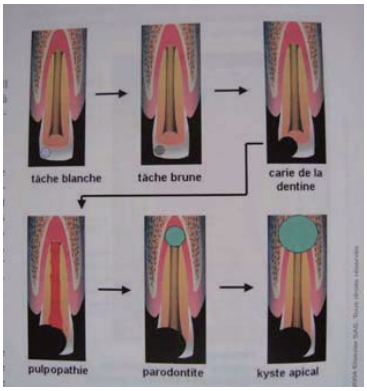


Fig. 2. Les deux voies de propagation de l'infection dentaire.

Evolution of dental carie



Radiographs: Radicular cyst

- 1a. Granulome apical
- 1b. Radicular cyst

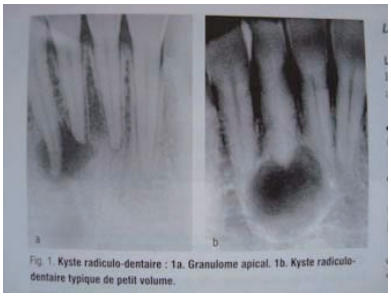
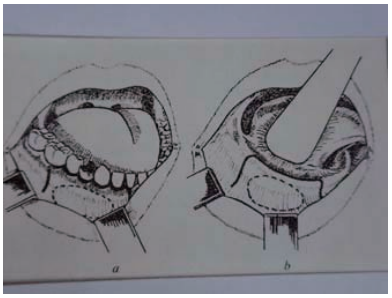


Fig. 1. Kyste radiculo-dentaire : 1a. Granulome apical. 1b. Kyste radiculo-dentaire typique de petit volume.

Treatment of radicular cyst

- Surgical Enucleation + treatment of caused teeth (avulsion or radicular obturation with apical resection).
- Line of incision:
- on the collar or
- On the crest of alveolar
- Suture of gingiva with Vicryl 4X0



Thank you for your attenton

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Appendix

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Contributors

- **Nihon University, Japan**

Kichibee Otsuka,
Dean, Department of Biochemistry, Nihon University School of Dentistry

Koichi Ito
Vice Dean, Department of Periodontology, Nihon University School of Dentistry

Fumiyuki Kuwata
Professor, Department of Basic Science, Nihon University School of Dentistry

Kazuya Honda
Professor, Department of Maxillofacial Radiology, Nihon University School of Dentistry

Yuzo Kon
Chief, the Educational Affairs Department, Nihon University School of Dentistry

Osamu Suzuki
Chief, Research Affairs Section, Nihon University School of Dentistry

Kosuke Nagata
Associate Chief, the Educational Affairs Department, Nihon University School Dentistry

Chanthasone Inthavong
Co-representative, Action with Lao Children

Nozomi Phonsavanh
Project coordinator, Nihon University of School of Dentistry

- **University of Health Sciences, Lao PDR (Listed in alphabetical order)**

Alongkone Phengsavane
Doctor, Faculty of Postgraduate study, University of Health Sciences

Aloungnadeth Sitthiphanh
Vice President, Faculty of Dentistry, University of Health Sciences

Angkham Ounavong
Lecturer, Faculty of Basic Sciences, Faculty of Medicine, University of Health Sciences

Anousavanh Sanaphay
Faculty of Medicine, University of Health Sciences

Duangsavanh Pengmanivong
Doctor, Faculty of Dentistry, University of Health Sciences

Ketsomesouk Bouphavanh
Doctor, Faculty of Medicine, University of Health Sciences

Kongmany Chaleunvong
Doctor, Faculty of postgraduate study, University of Health Sciences

Maifong Maixay
Doctor, Faculty of postgraduate study, University of Health Sciences

Phonesavanh Soundara
Doctor, Faculty of Dentistry, University of Health Sciences

Sackpaseut Homsombat
Doctor, Dental Clinic, Mahosot Hospital

Sengphouvanh Ngonephady
Director, Faculty of Dentistry, University of Health Sciences

Somboune Phomtavong
Associate Professor, Faculty of Public Health, University of Health Sciences

Vatsana Chanthamalinh
Doctor, Faculty of Dentistry, University of Health Sciences