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NYU LUTHERAN-DENTAL MEDICINE

Dental Public Health &
Pediatric Dental Rehabilitation Under General Anesthesia

08 OCTOBER 2016

Dental Public Health &

Pediatric Dental Rehabilitation Under General Anesthesia

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School of Public Health: Harvard School of Public Health
Diplomate, American Board of Pediatric Dentistry
Diplomate, National Board of Public Health Examiners

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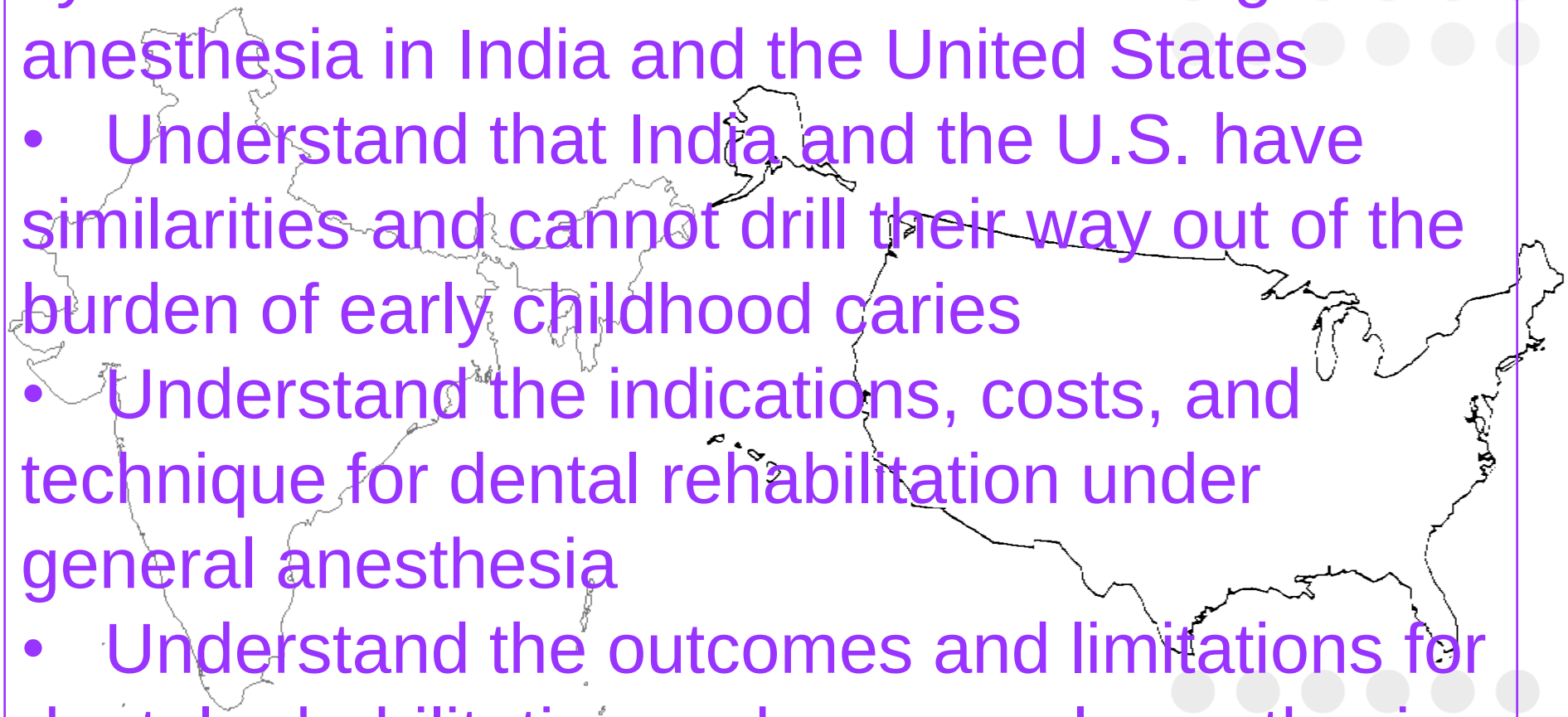
Goals & Objectives

- Understand the supply, demand, and delivery systems for dental rehabilitation under general anesthesia in India and the United States
- Understand that India and the U.S. have similarities and cannot drill their way out of the burden of early childhood caries
- Understand the indications, costs, and technique for dental rehabilitation under general anesthesia
- Understand the outcomes and limitations for dental rehabilitation under general anesthesia



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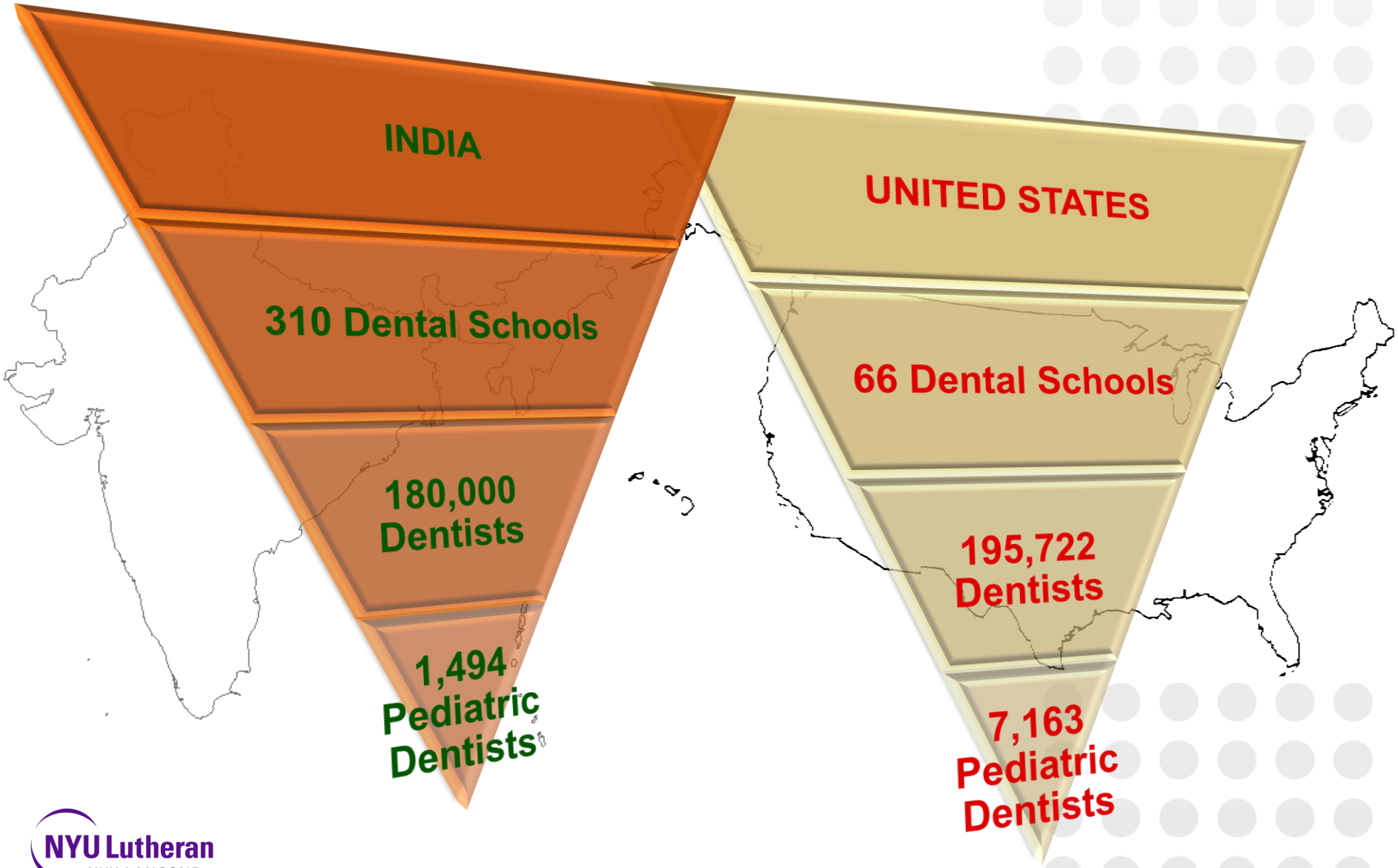
India & the United States
Supply of Dentists



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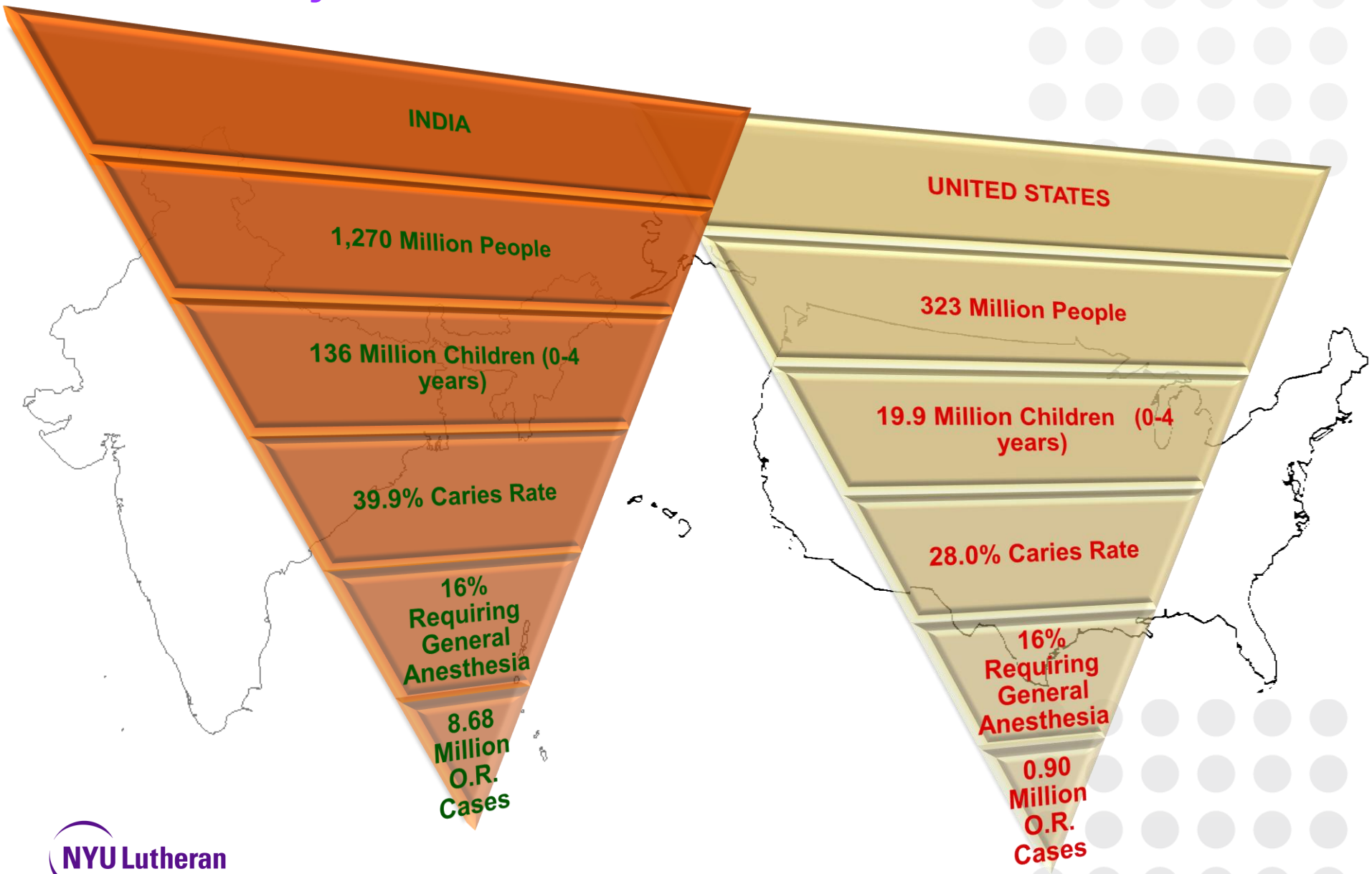
India & the United States
Demand by Patients



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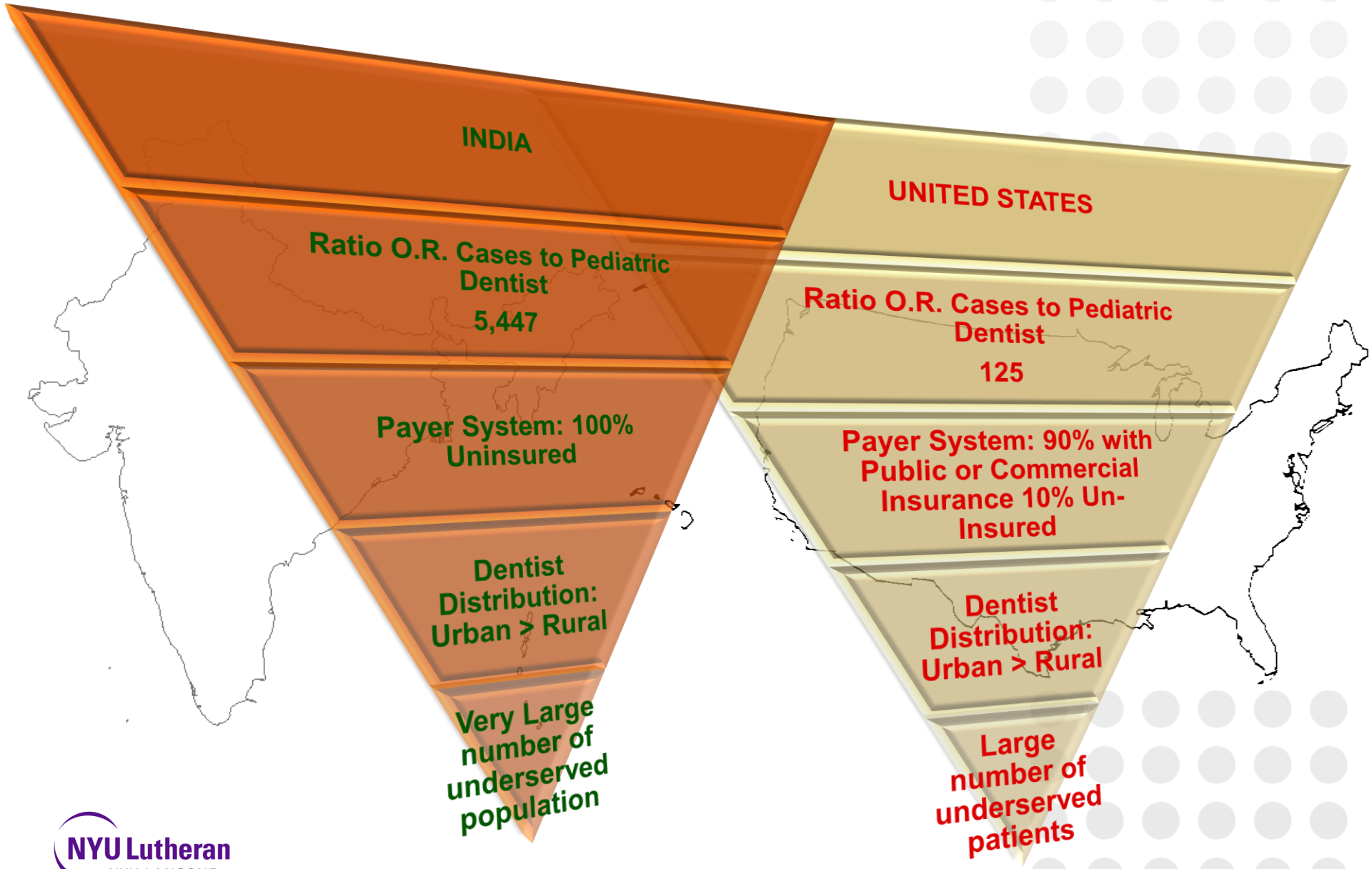
India & the United States Delivery System



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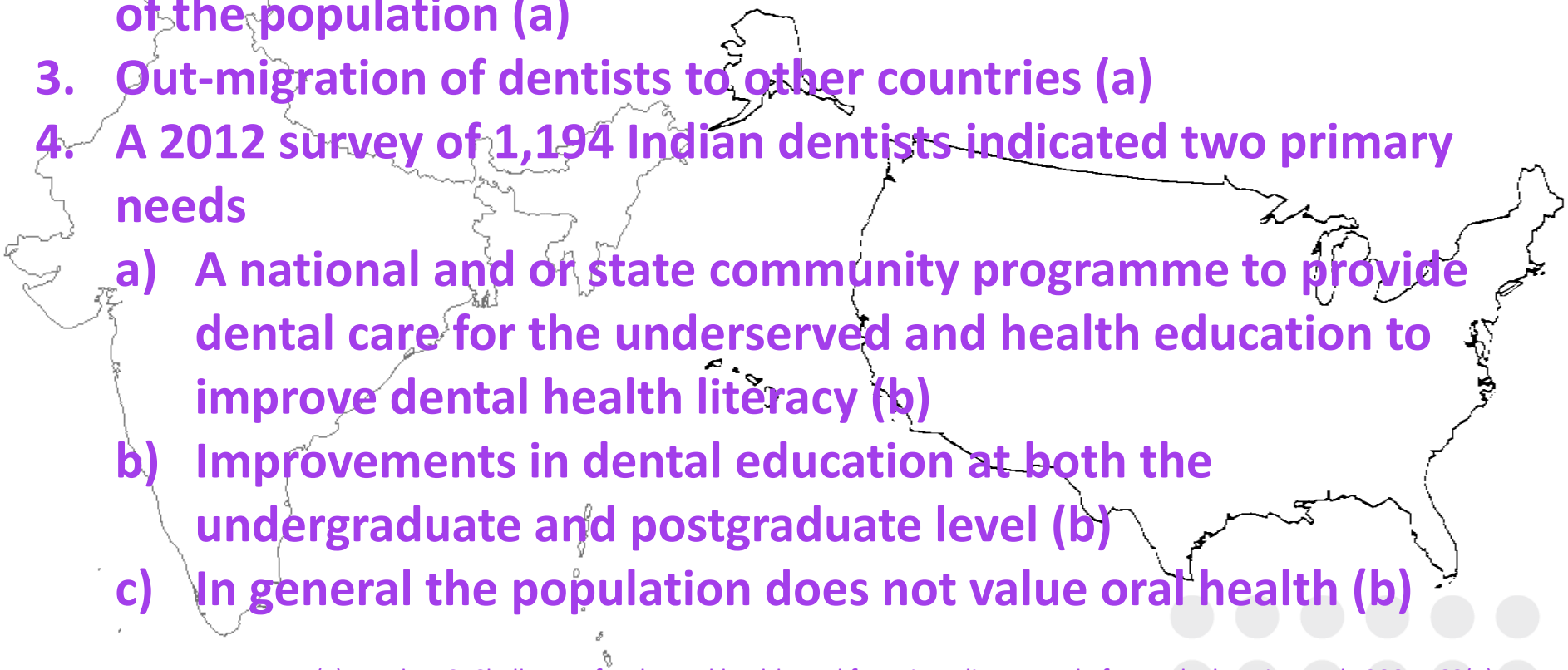
The Situation in India

1. From 1960 to 2002: Increase from 1,370 to 26,000 dental school graduates per year (a)
2. 75% of dentists locate to urban areas, which contains only 25% of the population (a)
3. Out-migration of dentists to other countries (a)
4. A 2012 survey of 1,194 Indian dentists indicated two primary needs
   a) A national and or state community programme to provide dental care for the underserved and health education to improve dental health literacy (b)
   b) Improvements in dental education at both the undergraduate and postgraduate level (b)
   c) In general the population does not value oral health (b)



(a) Tandon, S. Challenges for the oral health workforce in India. Journal of Dental Education. July 2004. 68(7) Supplement. pp. 28-33

(b) Bedi. R. Call for action: Improving dental services and oral health in India. Global Child Dental Fund. http://www.gcdfund.org/sites/default/files/users/Indian%20Oral%20Health%20Survey%20Report%20-%20final.pdf accessed on September 18, 2016

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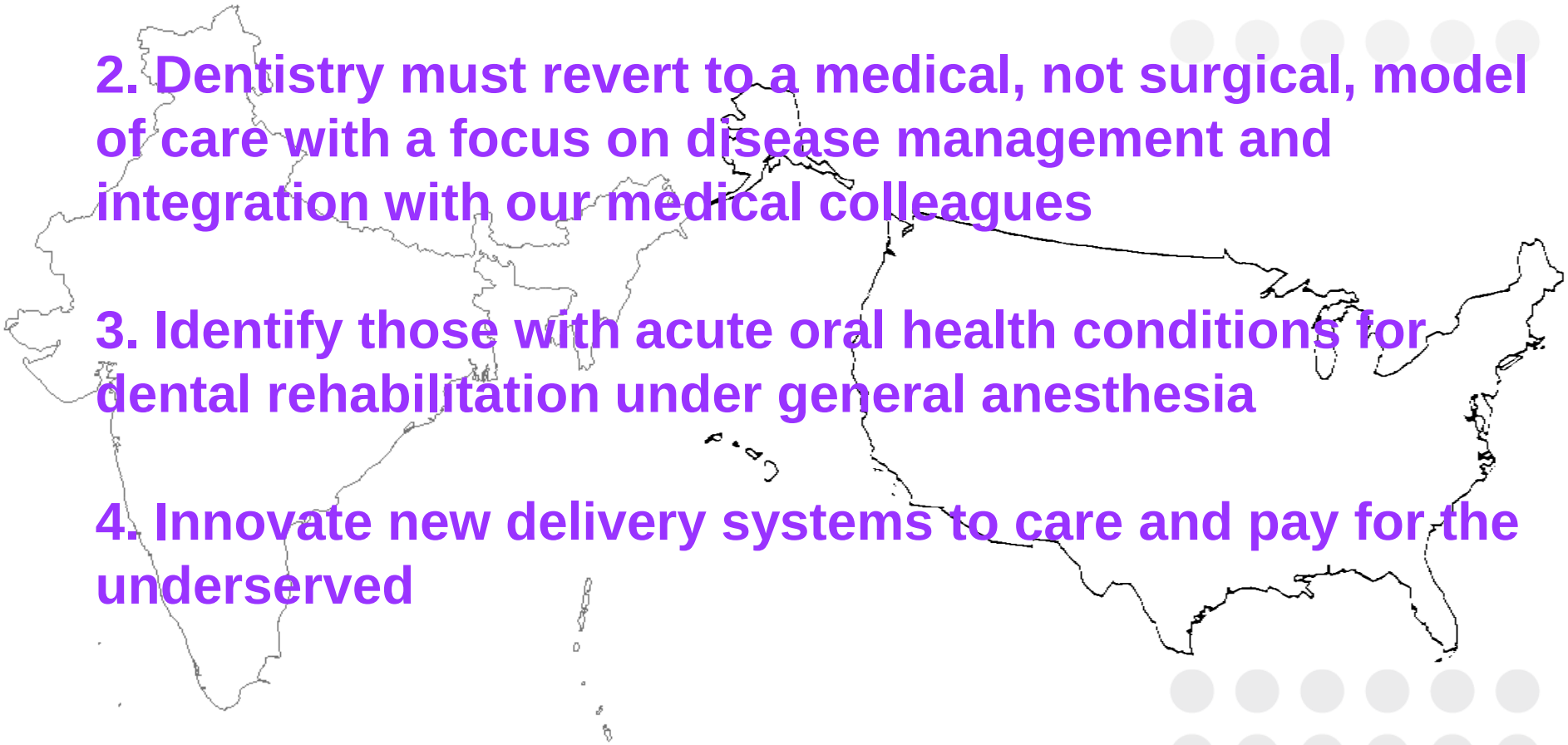
1. India and United States will not drill their way out of the disease burden of early childhood caries

2. Dentistry must revert to a medical, not surgical, model of care with a focus on disease management and integration with our medical colleagues

3. Identify those with acute oral health conditions for dental rehabilitation under general anesthesia

4. Innovate new delivery systems to care and pay for the underserved



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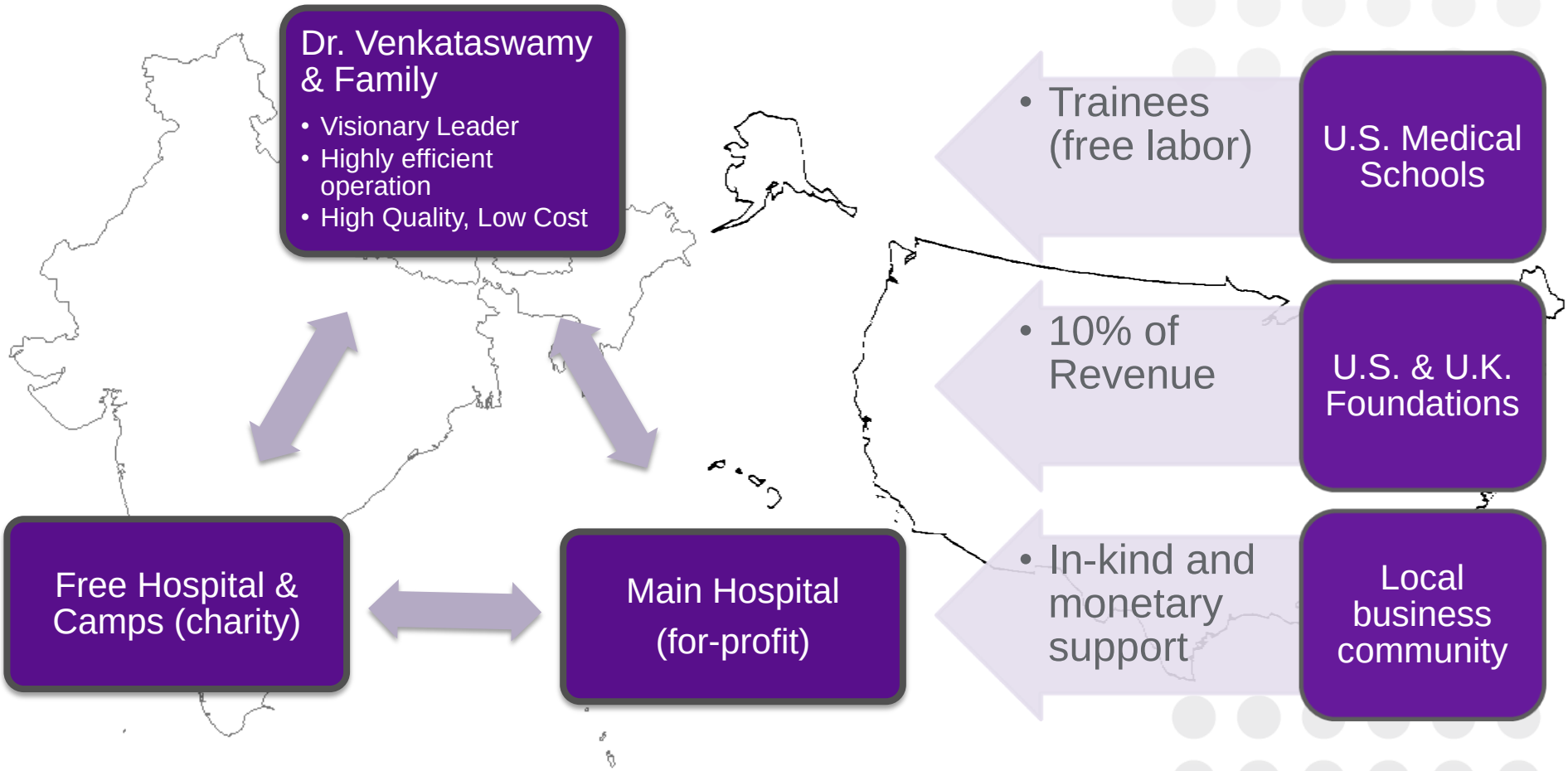
The Situation in India

The Aravind Eye Hospital Model



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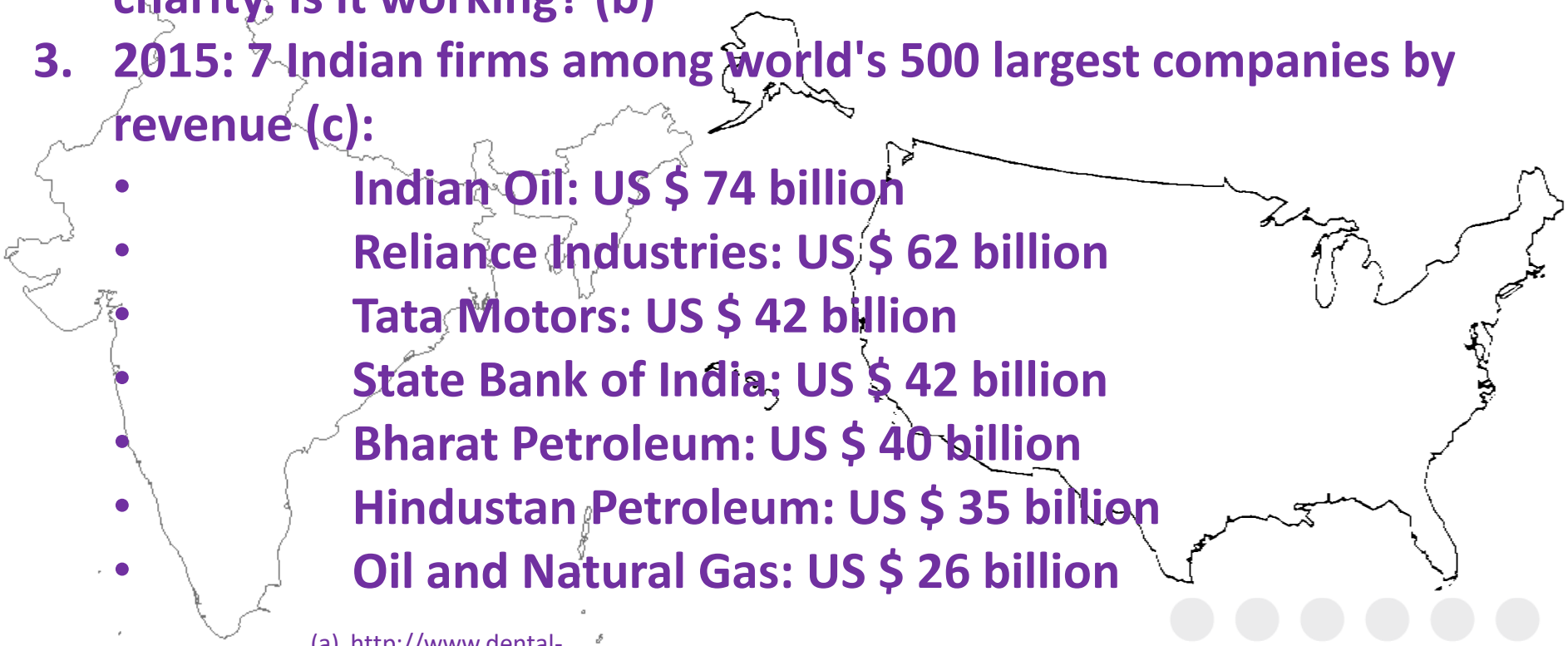
Rangan, V. The Aravind Eye Hospital, Madurai, India: In Service for Sight . http://www.bestfriendsnm.org/media/73801/in%20service%20for%20sight.pdf accessed September 18, 2016

The Situation in India

1. 2014: President Mukherjee admits oral health challenges, calls for revolution (a)
2. 2014: Indian law requires companies to give 2% of profits to charity. Is it working? (b)
3. 2015: 7 Indian firms among world's 500 largest companies by revenue (c):
   - Indian Oil: US $ 74 billion
   - Reliance Industries: US $ 62 billion
   - Tata Motors: US $ 42 billion
   - State Bank of India: US $ 42 billion
   - Bharat Petroleum: US $ 40 billion
   - Hindustan Petroleum: US $ 35 billion
   - Oil and Natural Gas: US $ 26 billion



(a) http://www.dental-tribune.com/articles/news/asiapacific/19946_mukherjee_admits_oral_health_challenges_calls_for_revolution.html

(b) https://www.theguardian.com/sustainable-business/2016/apr/05/india-csr-law-requires-companies-profits-to-charity-is-it-working

(c) http://timesofindia.indiatimes.com/business/india-business/7-Indian-firms-among-worlds-500-largest-companies-Fortune/articleshow/48185750.cms?from=md

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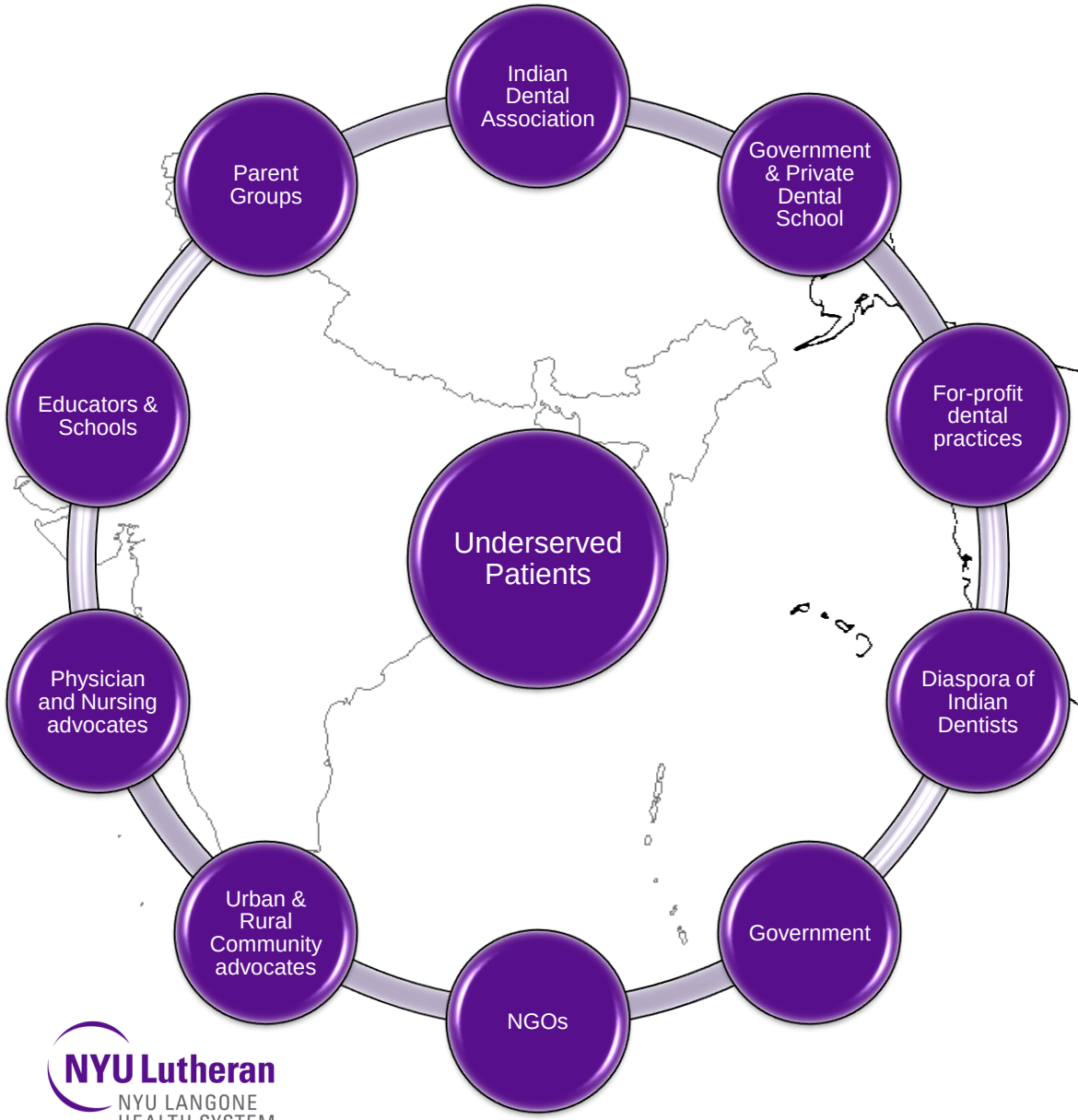
The Situation in India

Collaborative Oral Health Model



- Equitable care & Stakeholder mutual interests → Visionary Leader(s)
- Trainees (free labor) → U.S. and U.K. Dental Schools
- Monetary and In-kind support → U.S. & U.K. Foundations
- Monetary and In-kind support → Local business community
- Monetary and In-kind support → Large corporations

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Delivery of health care should be SEPTEE (a)

S = Safe

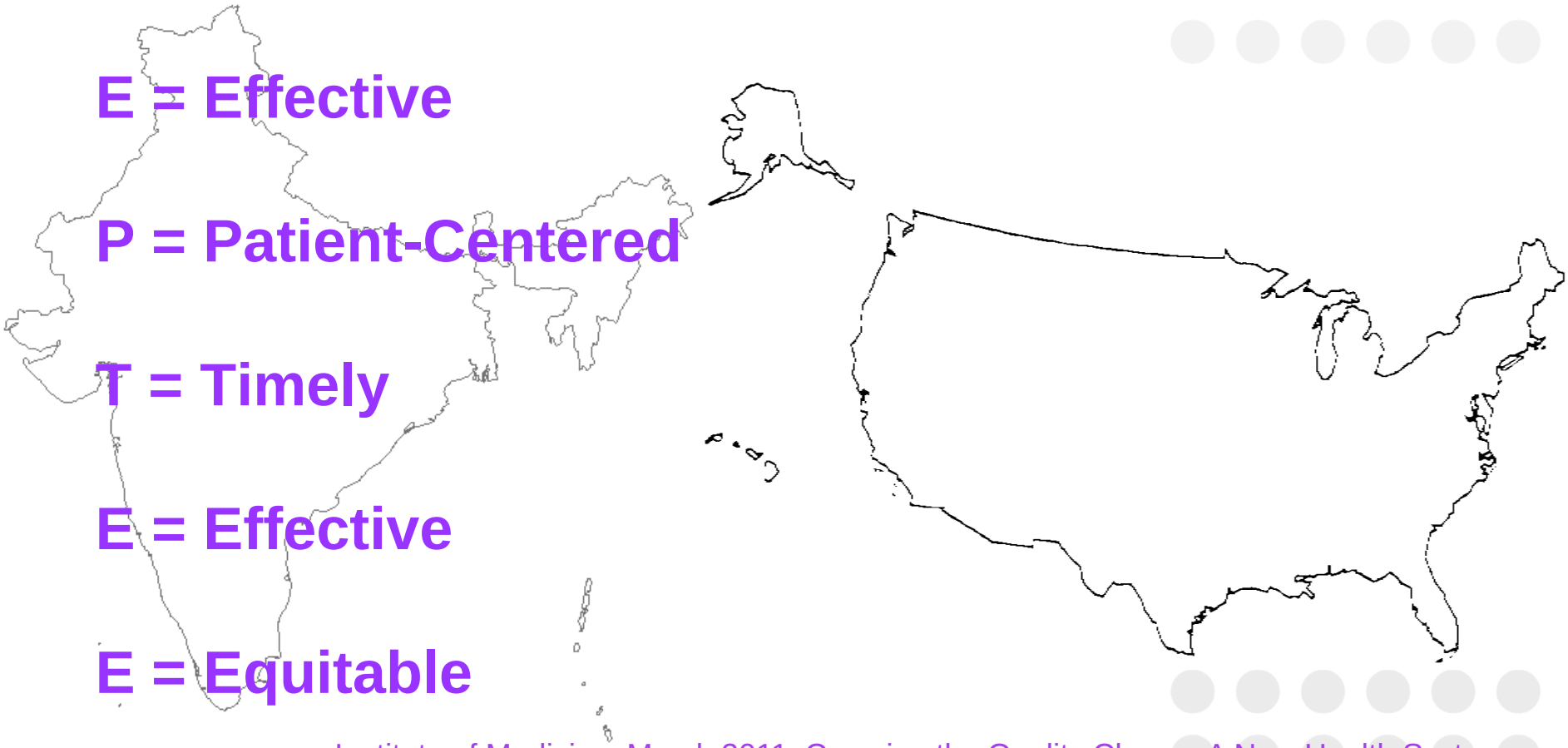
E = Effective

P = Patient-Centered

T = Timely

E = Effective

E = Equitable



Institute of Medicine. March 2011. Crossing the Quality Chasm: A New Health System for the 21st Century. Institute of Medicine. March 2011. https://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2001/Crossing-the-Quality-Chasm/Quality%20Chasm%202001%20%20report%20brief.pdf

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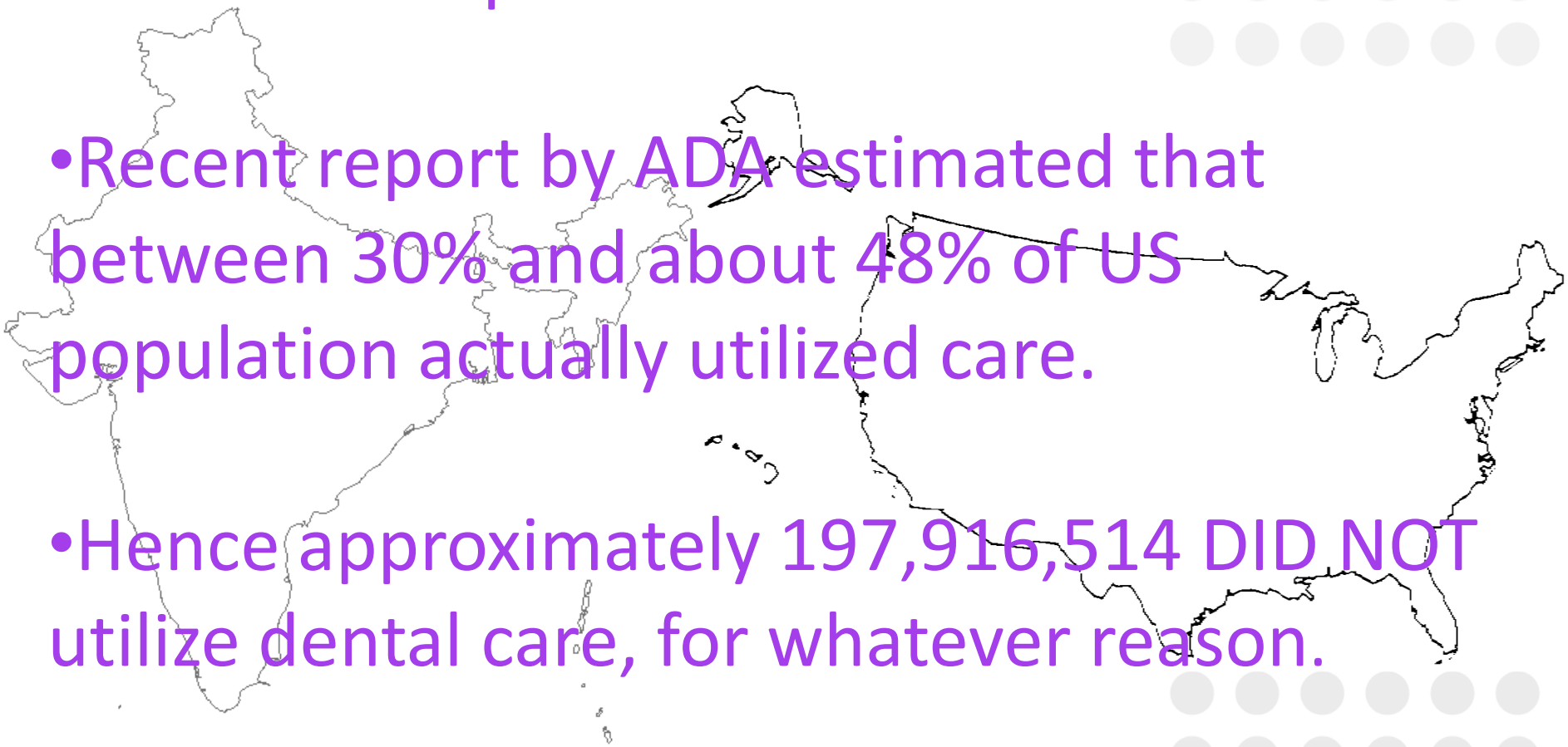
The Situation in United States

Access and Equitable Care



- Recent report by ADA estimated that between 30% and about 48% of US population actually utilized care.

- Hence approximately 197,916,514 DID NOT utilize dental care, for whatever reason.

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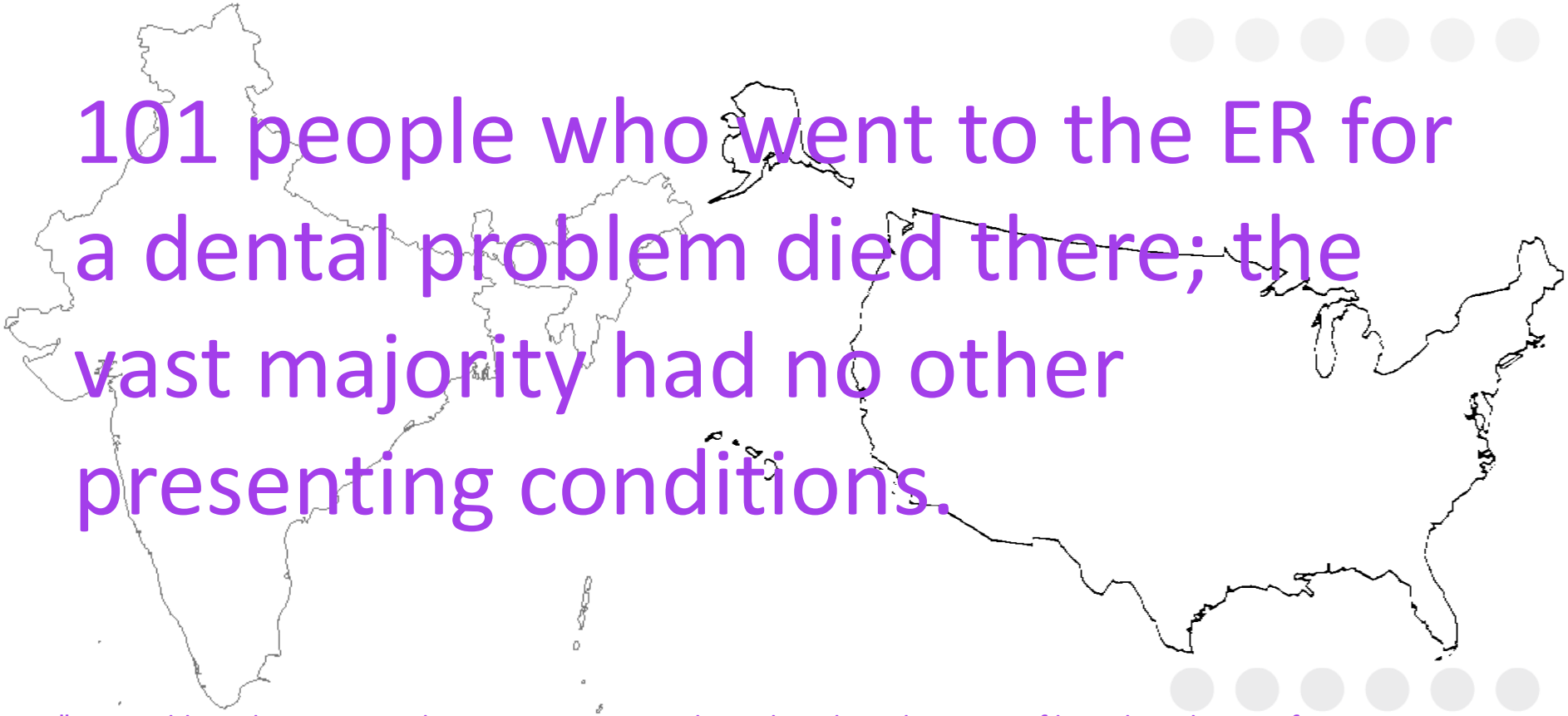
(Dental Care Utilization, Dental Benefits Coverage, and Cost Barriers: Update 2015 October 2015 - 61 min)

The Situation in United States



101 people who went to the ER for a dental problem died there; the vast majority had no other presenting conditions.

"Hospital-based emergency department visits involving dental conditions: Profile and predictors of poor outcomes and resource utilization," (Journal of the American Dental Association, 2014, 145(4):331-337.)

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The Situation in United States

A total of 66 patients died in hospitals over 9 year period of this study.

"Outcomes of hospitalizations attributed to periapical abscess from 2000 to 2008: a longitudinal trend analysis." J Endod. 2013 Sep;39(9):1104-10. doi: 10.1016/j.joen.2013.04.042. Epub 2013 Jul 11.

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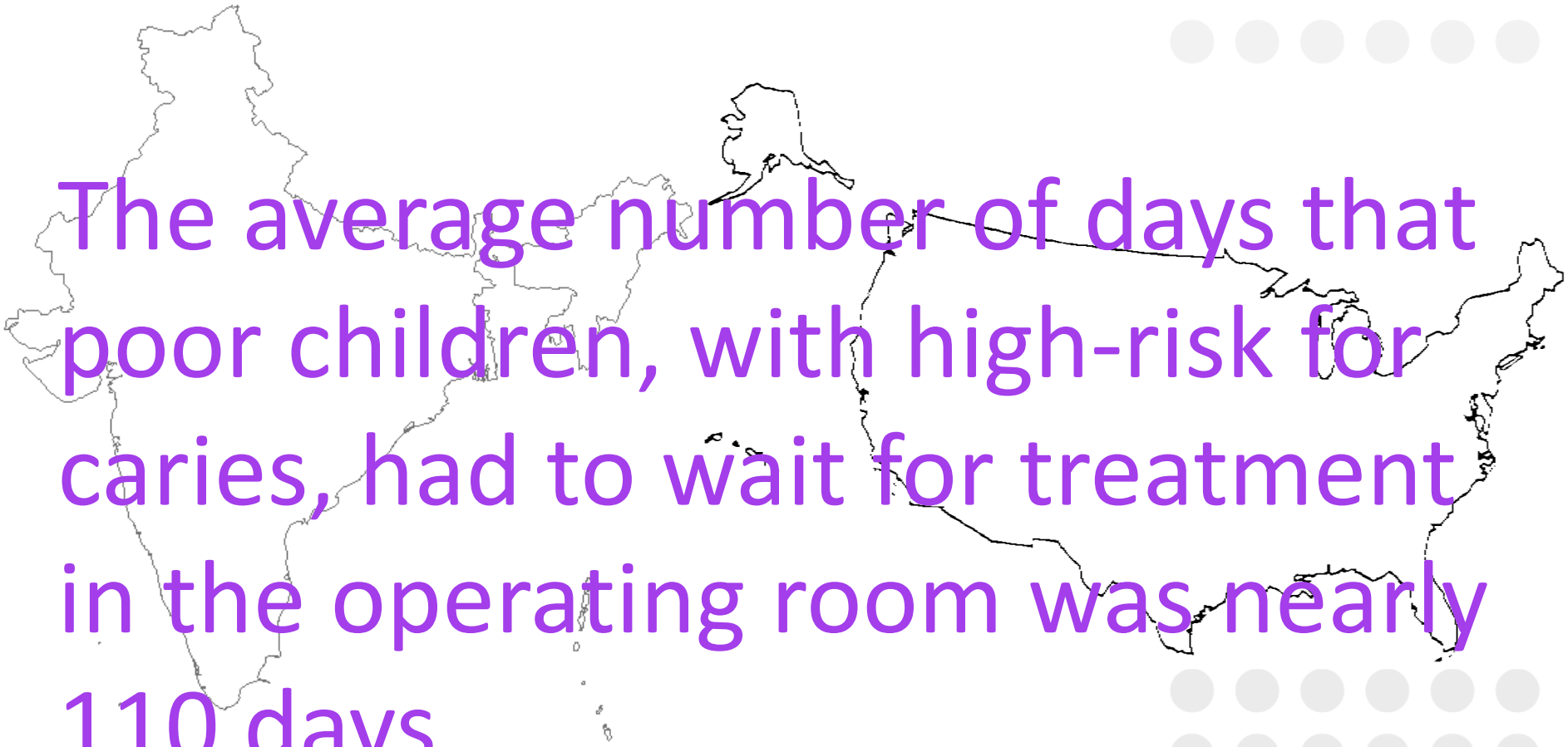
The Situation in United States

Timeliness for care



The average number of days that poor children, with high-risk for caries, had to wait for treatment in the operating room was nearly 110 days.

OKUJI, D., Engelhardt, A., Greabell, M., Sielski, J. International Journal of Paediatric Dentistry. Wait times for pediatric dental treatment under general anesthesia at three U.S. federally qualified health centers. 2015; 25(s1):126. doi: 10.1111/ipd.12170.

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Effective Care

- Rate of failure in children with ECC (early childhood caries) is extremely high.
- More aggressive management is required for children with ECC specially those undergoing general anesthesia

Procedures	Patients N	% failure
Amalgam	669	21
Stainless steel crowns	862	8
Composites	367	30
Composite strip crowns	63	51

"Failure rates of restorative procedures following dental rehabilitation under general anesthesia", AnupamaTate, Man Wai Ng, Howard Needleman, George Acs, Pediatric Dentistry, 2002.

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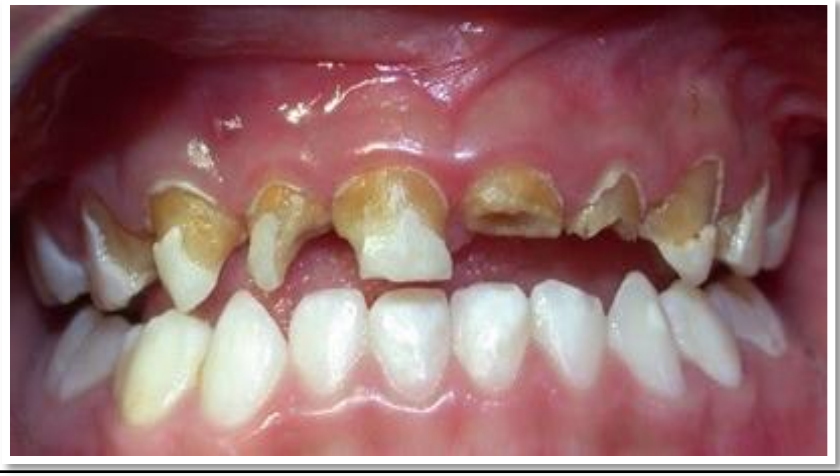
- Repeat full mouth rehabilitation is high in children with ECC
- 79% of ECC children had new detectable carious lesions compared to 29% of the control group
- 17% of ECC children had a repeat full mouth under general anesthesia in 2 years



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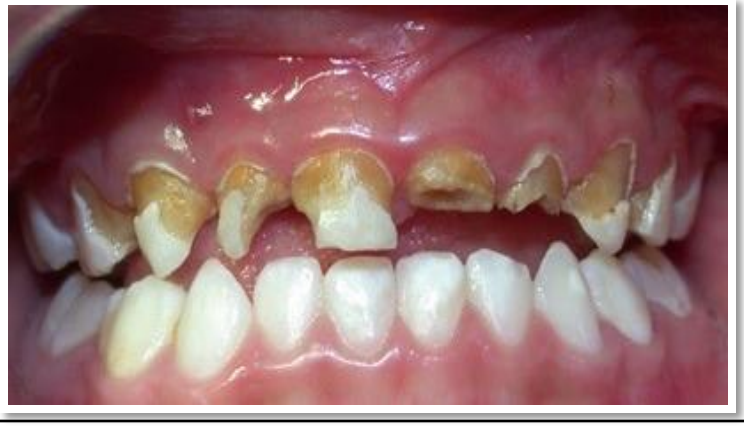
"Future caries susceptibility in children with early childhood caries following treatment under general anesthesia", Anna Almeida, Mark Rosman, MichealSheff, Christopher Hughes, Pediatric Dentistry, 2000.

- 53% of children treated under GA had new lesions within the first 6 month
- 46% of the new lesions developed in the primary dentition and 11.9% developed in the permanent dentition
- Repeat of GA in studies ranged between 37%-79%



"Clinical Outcomes for Early childhood Caries: Influence of Aggressive dental Surgery", C. Graves, R. Berkowitz, H. Proskin, P. Weinstein, R. Billings, Journal of Dentistry for Children, 2004.

"Recurrence of Early Childhood Caries after Comprehensive treatment with General Anesthesia and Follow up", C. Tyger Foster, H. Perinpanayagam, A. Pafaffenbach, M. Certo, Journal of Dentistry for Children, 2006.

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- Reason for Repeat GA in healthy children:
  1. Patient Factors:
     a. 100% involvement of the maxillary central incisors at the time of initial GA
     b. Continued use of the bottle at the time of the initial GA
     c. Poor cooperation in the medical/dental setting
     d. Difficult personality as described by the parents
  2. Parent Factors:
     a. Adult not brushing the child's teeth

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"Reason for Repeat Dental Treatment Under General Anesthesia for the Healthy Child", B. Sheller, B. Williams, K. Hayes, L. Mancl, Pediatric Dentistry, 2003.

b. Dysfunctional social situation

c. Failure to return for the postoperative dental appointment after initial treatment

- Strategies to improve the success with high caries risk patients include:
  a. Aggressive treatment of caries
  b. Medical management of caries
  c. Active postoperative follow up and education of the caregivers

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"Reason for Repeat Dental Treatment Under General Anesthesia for the Healthy Child", B. Sheller, B. Williams, K. Hayes, L. Mancl, Pediatric Dentistry, 2003.

Deliver of health care should be SEPTEE (a)

U.S. Grade Card for Pediatric Dental Rehabilitation under general anesthesia

Grading Criteria	Grade (5 = Excellent; 3 = Average; 1 = Poor)
Safe	4
Efficient	2
Patient-Centered	3
Timely	2
Effective	2
Equitable	3

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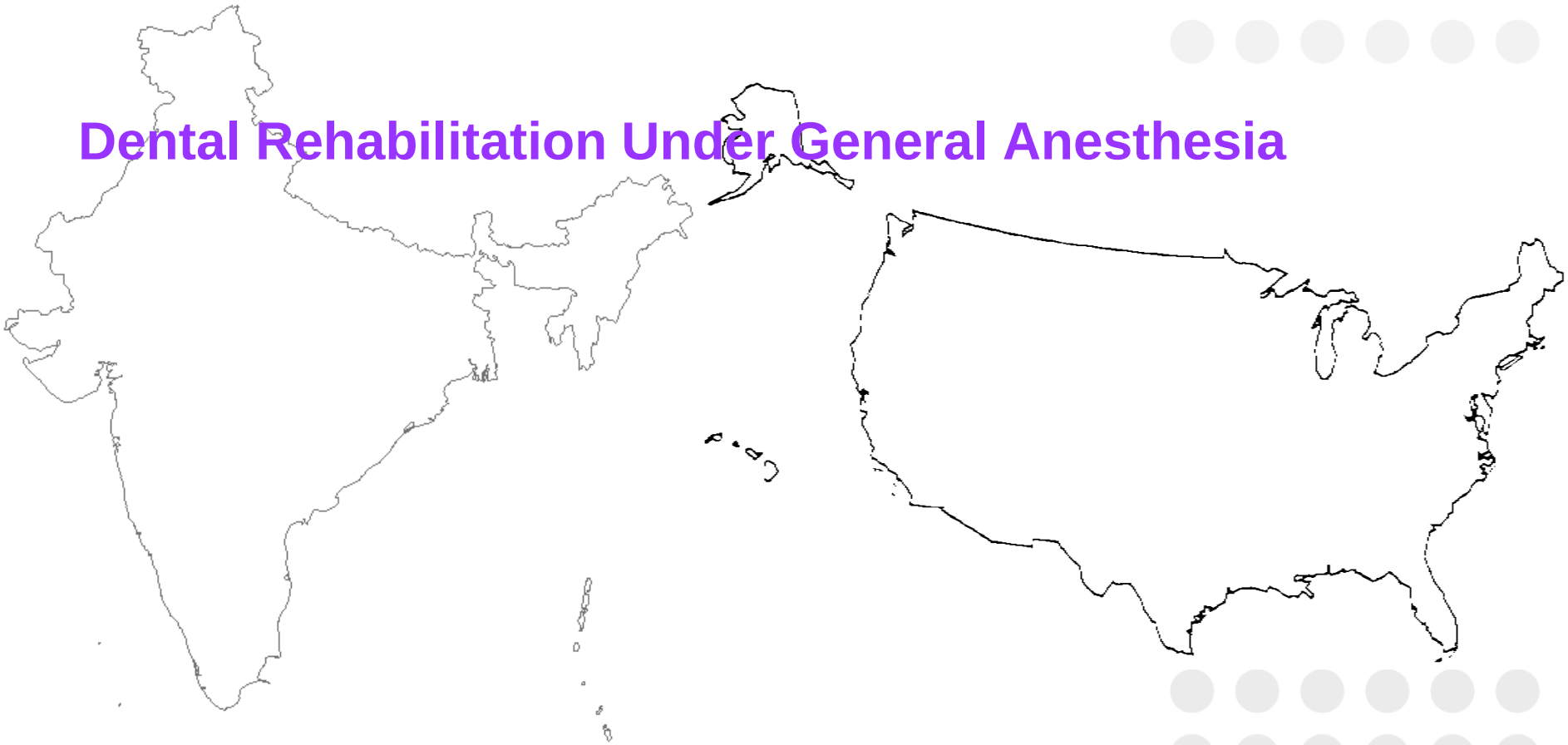
Dental Rehabilitation Under General Anesthesia



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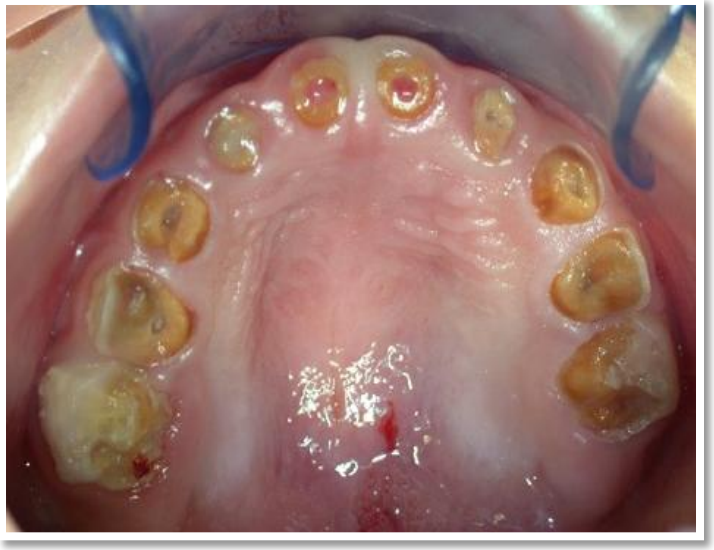
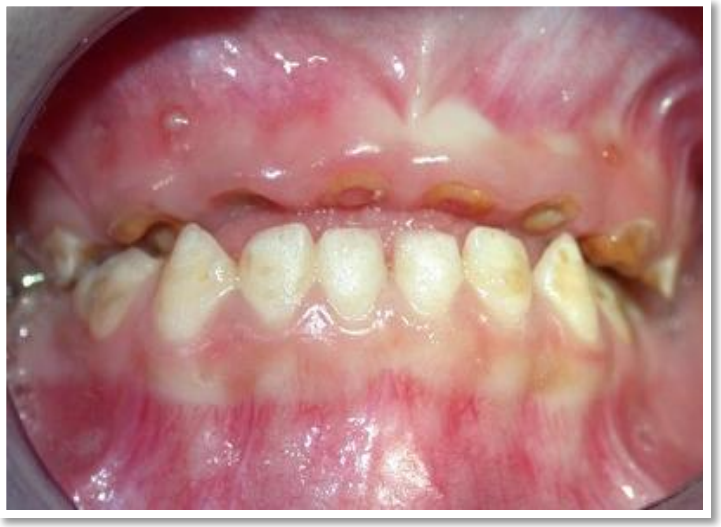
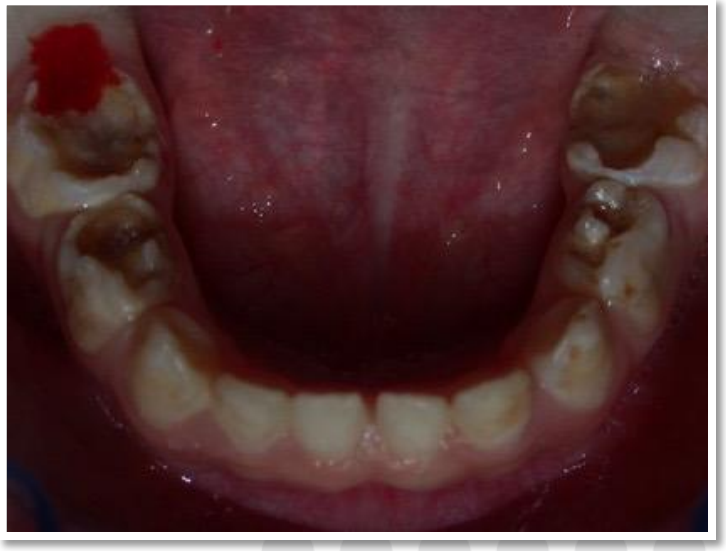
What to see and what to do?







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Pediatric Dental Rehabilitation under General Anesthesia

- Introduction
- Indication
- Contraindications
- Procedure
- Advantages and disadvantages
- Cases

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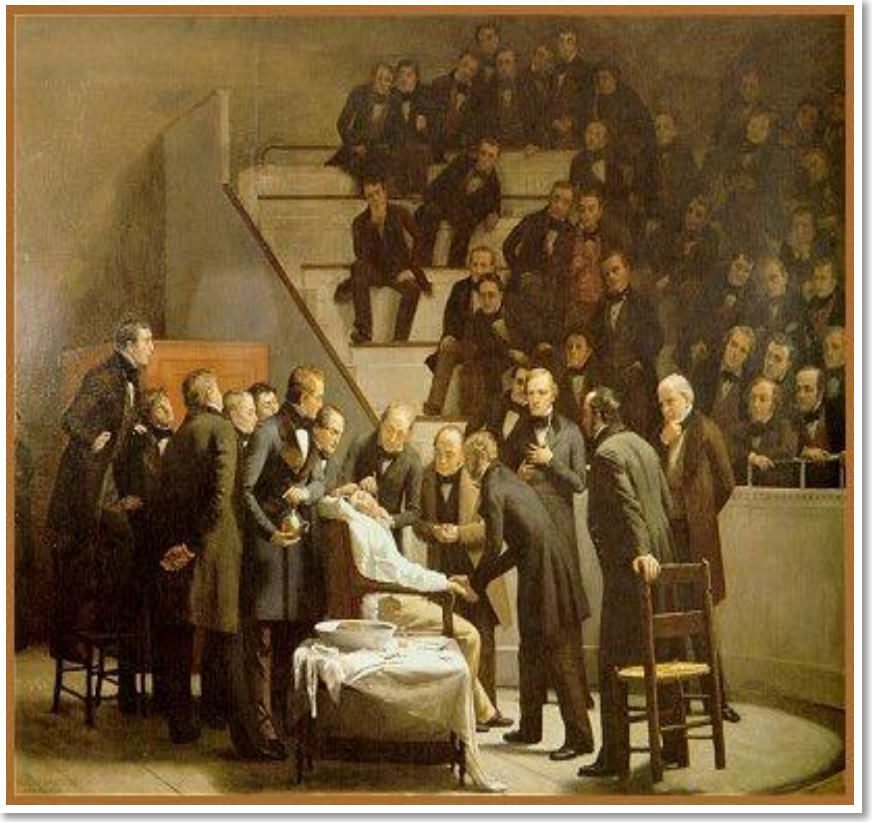
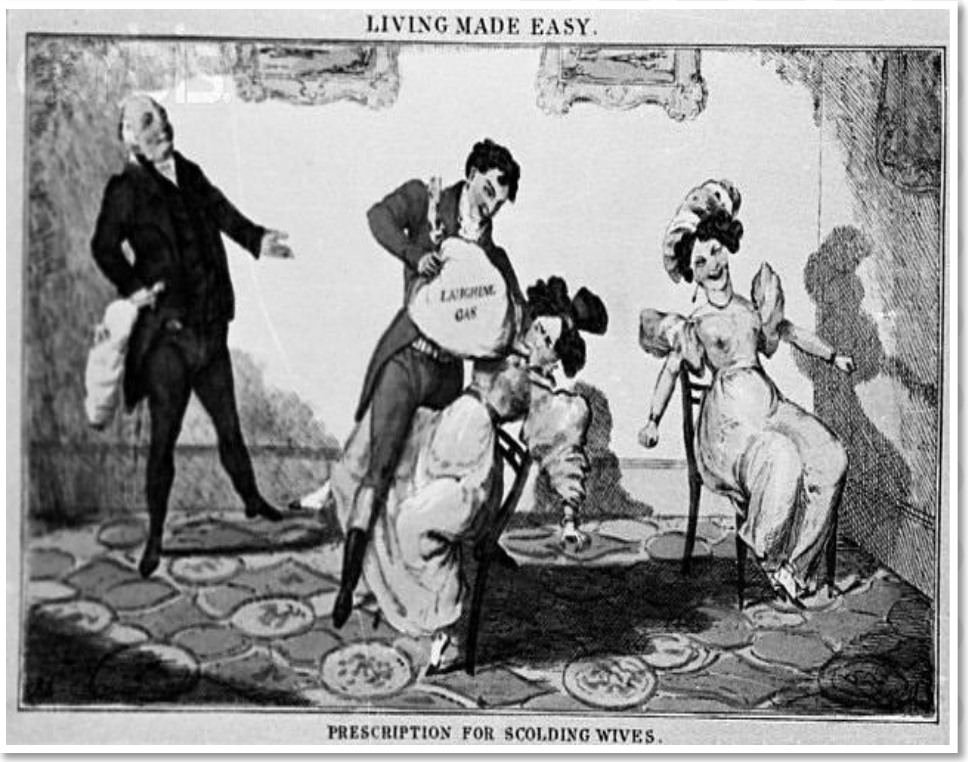
First use of regional anesthesia was on December 11, 1844





"Sedation: A Guide to Patient Management". Stanley F. Malamed, Fourth edition, 2003.

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- In Pediatric Dentistry: Hospital dentistry/general anesthesia is used to provide *safe* and *comprehensive* dental care for pediatric patients with behavioral, medical and/or extensive oral health care needs that preclude treatment in the dental office setting

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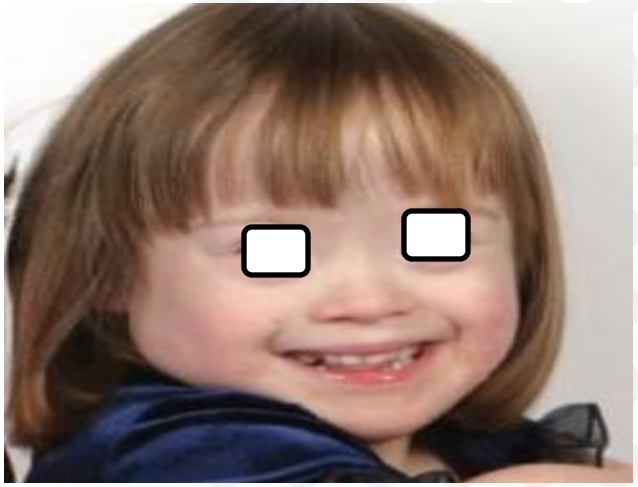
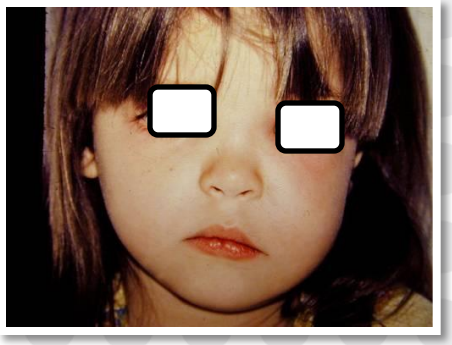
WHEN???

1. Patients with certain physical, mental or medically compromising condition
2. Patients with dental and restorative or surgical needs for whom local anesthesia is ineffective because of acute infection, anatomical variation or allergy





"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

"Sedation: A Guide to Patient Management". Stanley F. Malamed, Fourth edition, 2003.

3. Precooperative and extremely uncooperative, fearful, anxious, combative, or uncommunicative child or adolescent with substantial dental needs with no expectation that the behavior will improve

4. Patients who have sustained extensive dental and facial trauma.

"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

"Sedation: A Guide to Patient Management". Stanley F. Malamed, Fourth edition, 2003.

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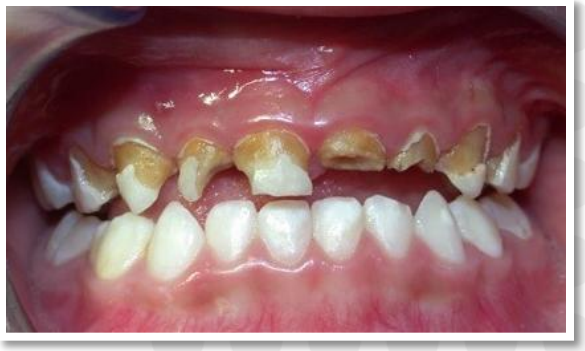
5. Patients with immediate comprehensive oral or dental needs who otherwise would not receive comprehensive dental care



6. Patients requiring dental care for whom the use of General Anesthesia may protect the developing psyche and/or reduce medical risks.

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"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

"Sedation: A Guide to Patient Management". Stanley F. Malamed, Fourth edition, 2003.

Treatment Requirements (Carious and/or Abscessed Teeth)	Points
1-2 teeth or one sextant	3
3-4 teeth or 2-3 sextants	6
5-8 teeth or 4 sextants	9
9 or more teeth or 5-6 sextants	12

Behavior of Client**	Points
Definitely negative–unable to complete exam, client unable to cooperate due to lack of physical or emotional maturity, and/or disability	10
Somewhat negative–defiant; reluctant to accept treatment; disobeys instruction; reaches to grab or deflect operator's hand, refusal to take radiographs	4
Other behaviors such as moderate levels of fear, nervousness, and cautious acceptance of treatment should be considered as normal reponses and are not indications for treatment under general anesthesia	0
** Requires that narrative fully describing circumstances be present in the client's chart	

Additional Factors**	Points
Presence of oral/perioral pathology (other than caries), anomaly, or trauma requiring surgical intervention**	15
Failed conscious sedation**	15
Medically compromising of handicapping condition**	15
** Requires that narrative fully describing circumstances be present in the client's chart	

I understand and agree with the dentist's assessment of my child's behavior.

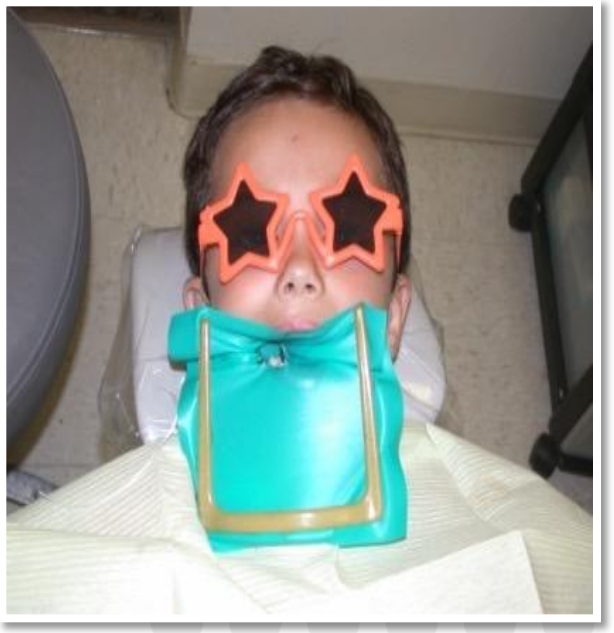
PARENT/GUARDIAN SIGNATURE: _____DATE: _____

Clients in need of general anesthesia who do not meet the 22-point threshold, by report, will require prior authorization.

To proceed with the dental care and general anesthesia, this form, the appropriate narrative, and all supporting documentation, as detailed in Attachment 1, must be included in the client's chart. The client's chart must be available for review by representatives of TMHP and/or HHSC.

- Contra-indications:

1. A healthy, cooperative patient with minimal dental needs
2. Predisposing medical condition that would make general anesthesia inadvisable



"The Hand Book of Pediatric Dentistry", Arthur J. Nowak, Paul S. Casamassimo, AAPD, 2007

"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

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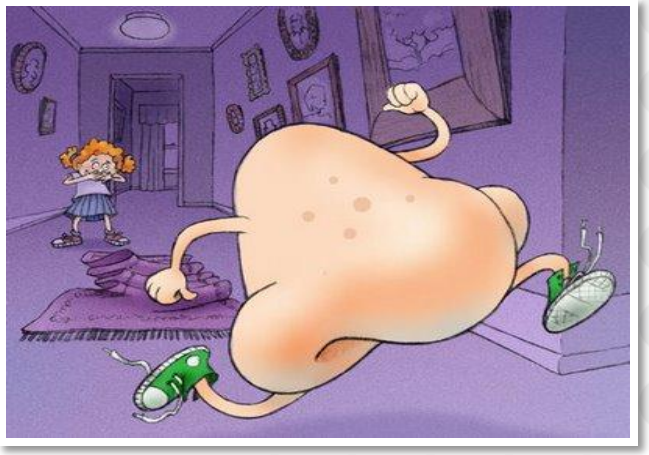
3. Active systemic infection with elevated temperature



4. NPO guidelines violations

"The Hand Book of Pediatric Dentistry", Arthur J. Nowak, Paul S. Casamassimo, AAPD, 2007

"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

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NPO GUIDELINES

	6-36 Months	>36 Months
Clear Liquids(water,fruit juices with no pulp,carbonated bev,clear tea)	2 Hours	2Hours
Breast Milk	4 Hours	NA
Formula/non human milk,light meal(toast with clear liquid)	6 Hours	6 Hours
Fried or fatty foods or meat	8 Hours	8 Hours

***For emergency procedures-8 hrs for solids and non human milk or determined by the attending anesthesiologist considering patient acuity and urgency of procedure.

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Resource section, AAPD Reference Manual, Clinical Guidelines, Volume 35, No.6, 2013/2014

American Society of Anesthesiologist Risk Assessment Classification

Class I	A normally healthy patient with no organic, physiologic, biochemical or psychiatric disturbance or disease
Class II	A patient with mild-to-moderate systemic disturbance or disease
Class III	A patient with severe systemic disturbance or disease.
Class IV	A patient with severe and life-threatening systemic disease or disorder
Class V	A moribund patient who is unlikely to survive without the planned procedure
Class VI	A declared brain dead patient whose organs are being removed for donor purposes

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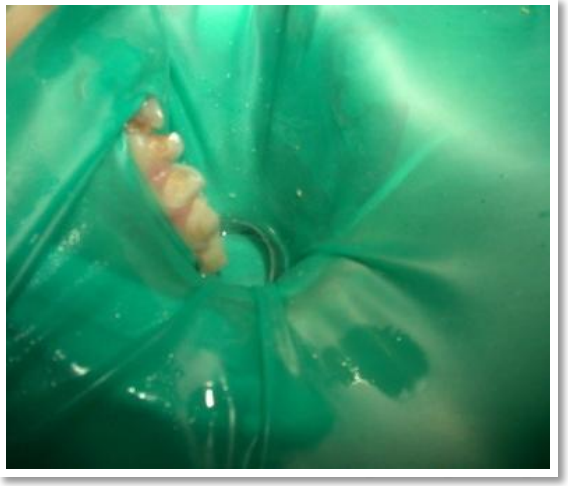
"The Hand Book of Pediatric Dentistry", Arthur J. Nowak, Paul S. Casamassimo, AAPD, 2007

What are we achieving???

1. Patient's safety and welfare by reducing untoward movement and reaction to dental treatment

2. Safe, efficient, patient-centered, timely, effective, & equitable dental care



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"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

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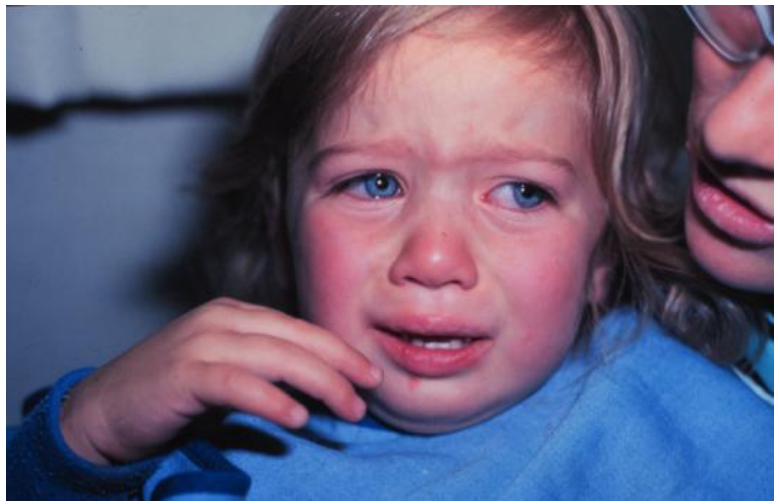
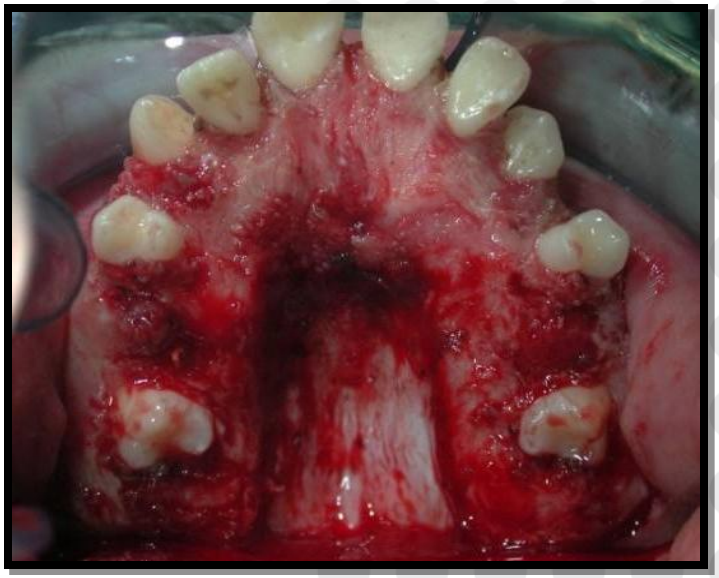
3. Eliminate anxiety and minimize psychological trauma



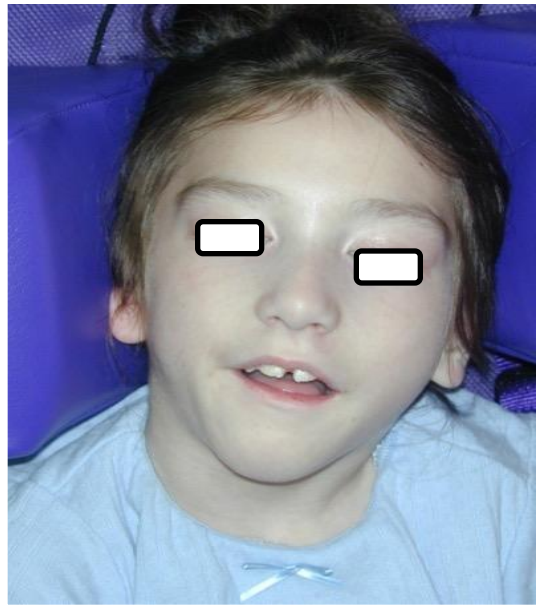
4. Eliminate the patient's pain response



"The Hand Book of Pediatric Dentistry", Arthur J. Nowak, Paul S. Casamassimo, AAPD, 2007

"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

5. To aid in the treatment of the mentally, physically, or medically compromised patients



"The Hand Book of Pediatric Dentistry", Arthur J. Nowak, Paul S. Casamassimo, AAPD, 2007

"Guideline on Behavior Guidance for the Pediatric Dental patient", AAPD Reference Manual, Clinical Guidelines, Volume 31, No.6, 2009/2010

Pediatric Medicine consultation:

- In specific situations (i.e. medically compromised patients, children with special needs) prior to surgery consult specialist

Anesthesia consultation:

- Consultation done early for patients with known medical conditions that may require special attention by the anesthetist (i.e history of laryngomalacia ,difficult airways,malignant hyperthermia, diabetes , OSA, etc.)
- Laboratory work, as required (Hematological Profile, Urine analysis)

"Sedation: A Guide to Patient Management". Stanley F. Malamed, Fourth edition, 2003.

"Dentistry for the Child and Adolescent", McDonald, Avery, Dean, 2004

The surgery:
Be prepared & organized beforehand

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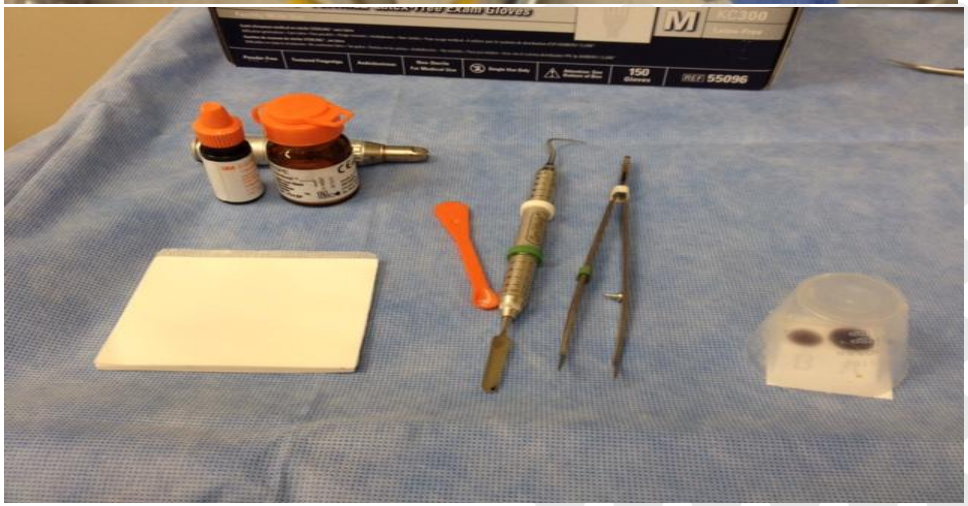
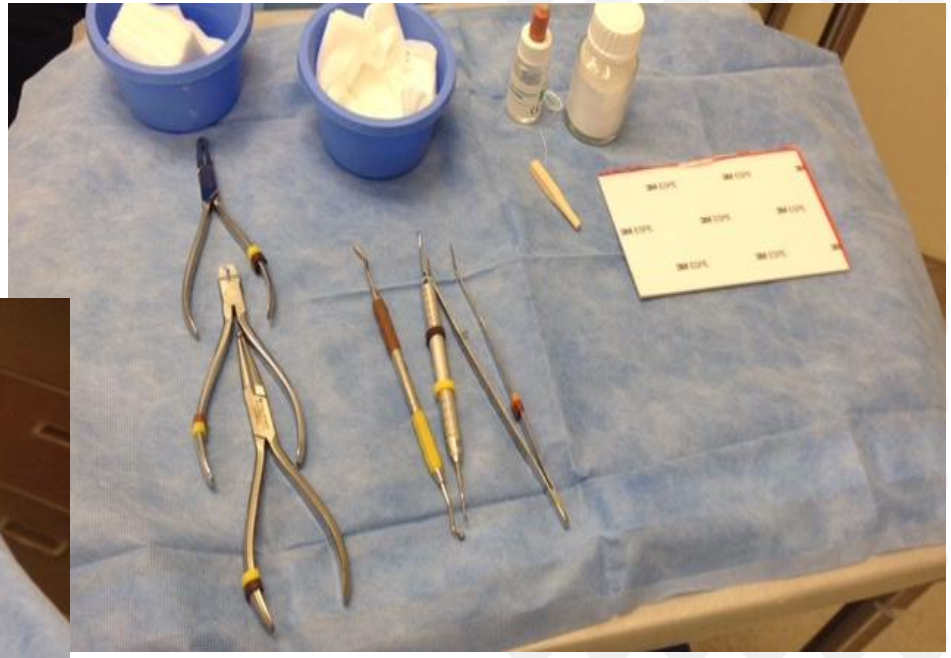
PORTABLE MOTOR UNIT

COMPOSITE SET-UP



PULPOTOMY & SSC SETUP



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EXTRACTION AND
MISCELLANEOUS INSTRUMENTS

USE AN EMERGENCY CART TO STORE YOUR MATERIALS AND STERLIZED INSTRUMENTS IN THE HOSPITAL

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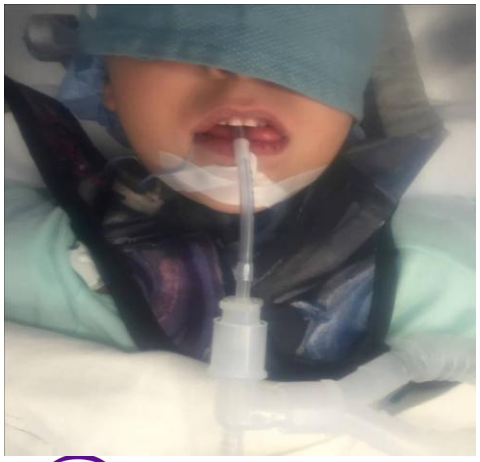
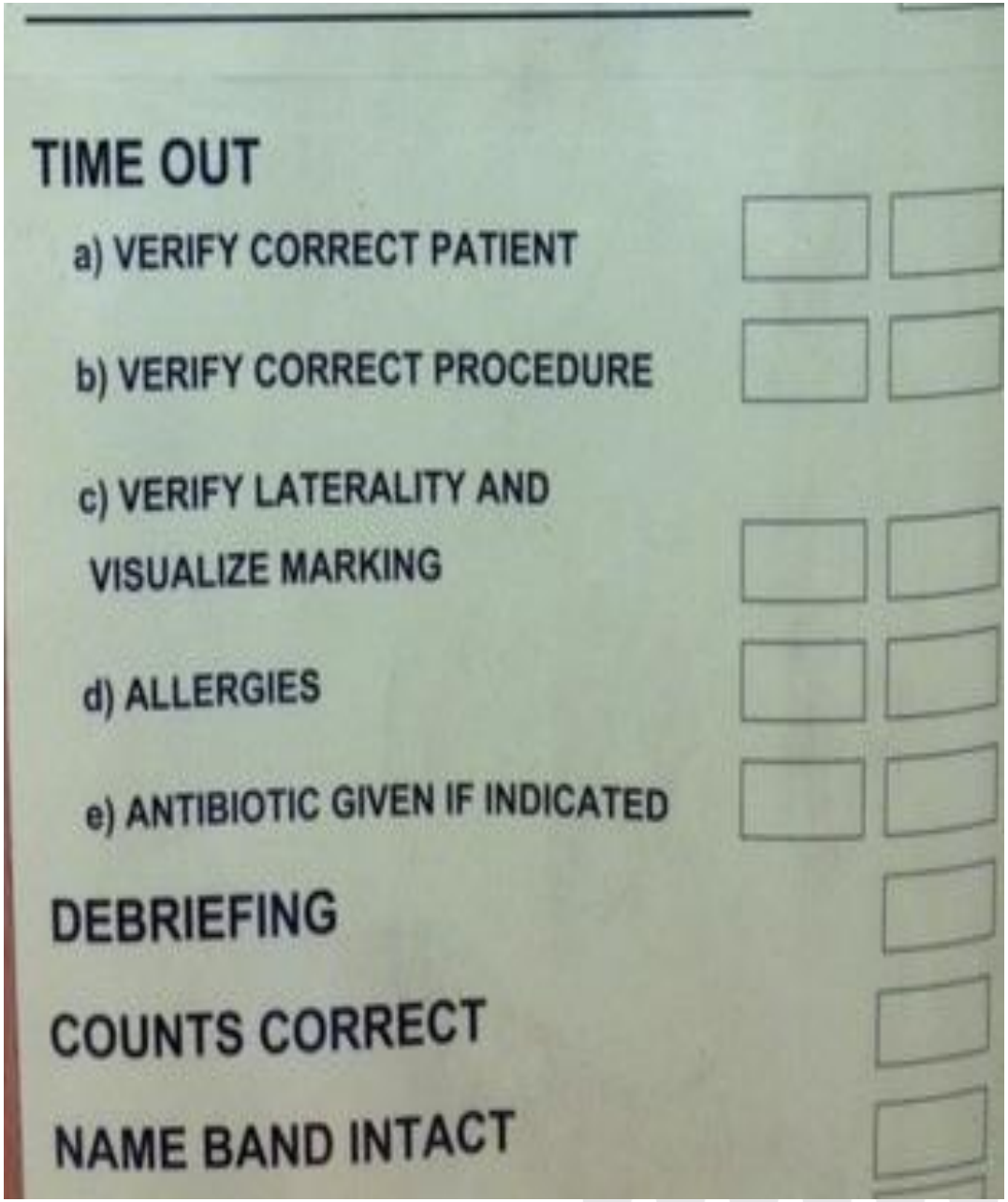
LET'S GET THE BALL ROLLING

INTUBATION

PT. DRAPING



TIME OUT



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Sequence of Events

1. Radiographs.
2. Place throat pack
3. Prophylaxis
4. Complete exam with review of radiographs
5. Confirm treatment plan
6. Rubber dam
7. Perform restorative procedure-Comp before SSC. Extractions and space maintainers in the end. Use local anesthesia for extractions
8. Advise anesthesiologist 10-15 mins before completion
9. Apply fluoride.
10. Check mouth and then remove throat pack.
11. Complete all the paperwork and postop orders!!

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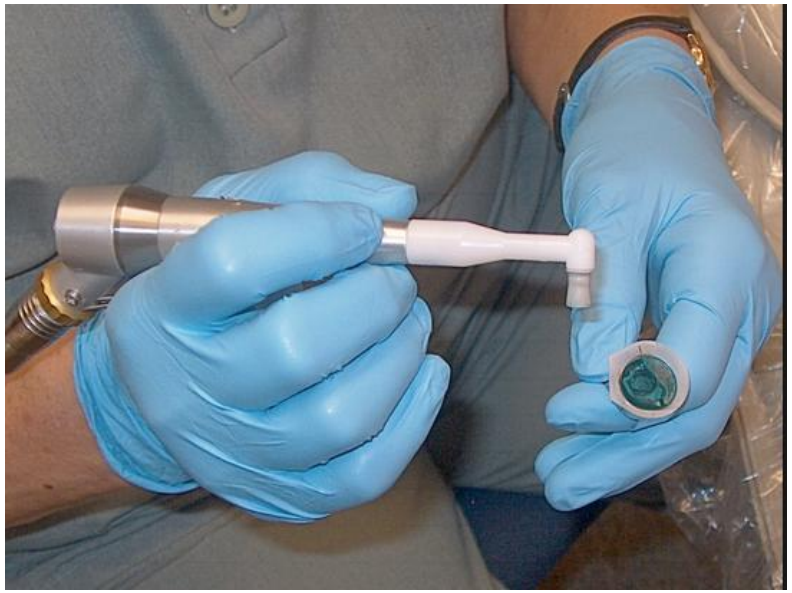

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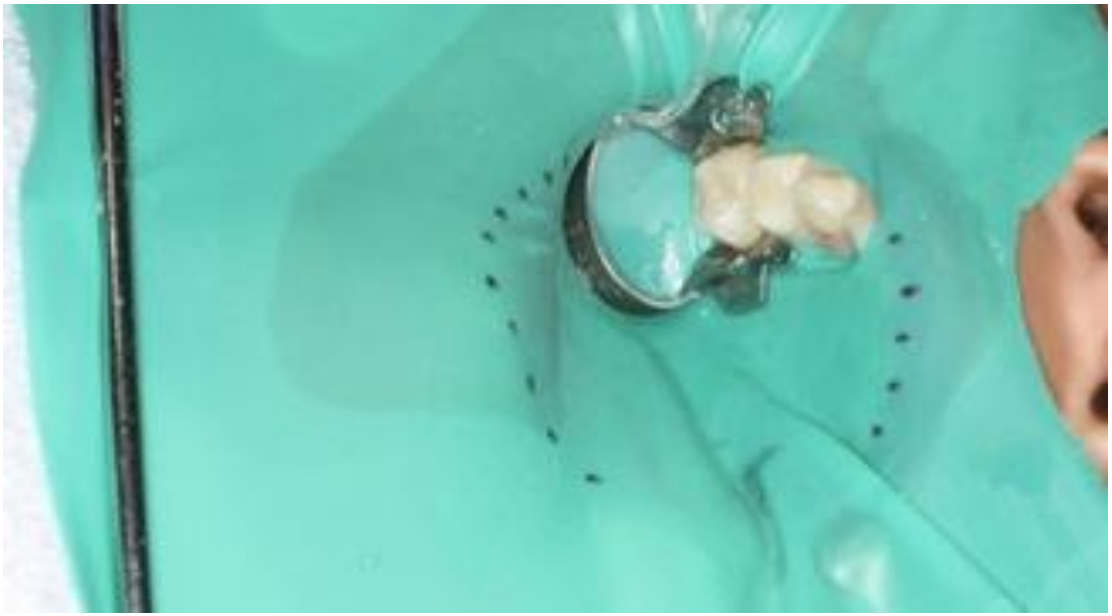
Tooth Isolation



Rubber Dam

Isolite type system: evacuator,mouth prop, cheek & tongue retractor

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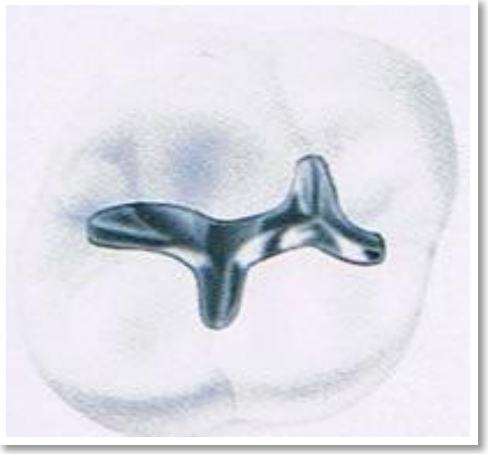
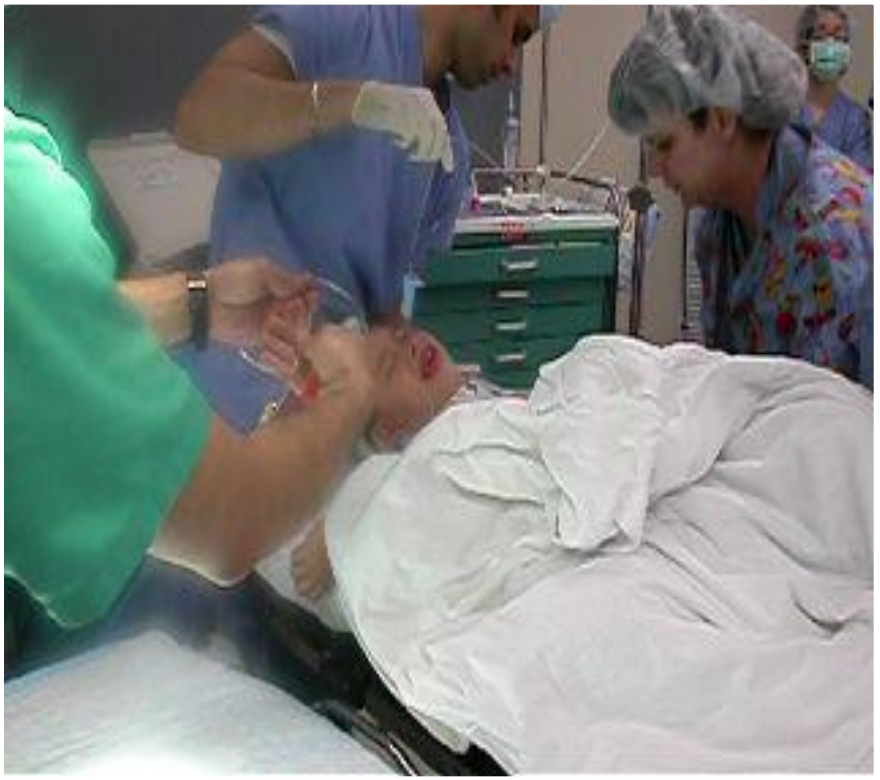



NuSmile
Primary Crowns


COMPULES® TIPS REFILL PACKAGE
ESTHET·X HD


UltraSeal XT plus

Postoperative Recovery



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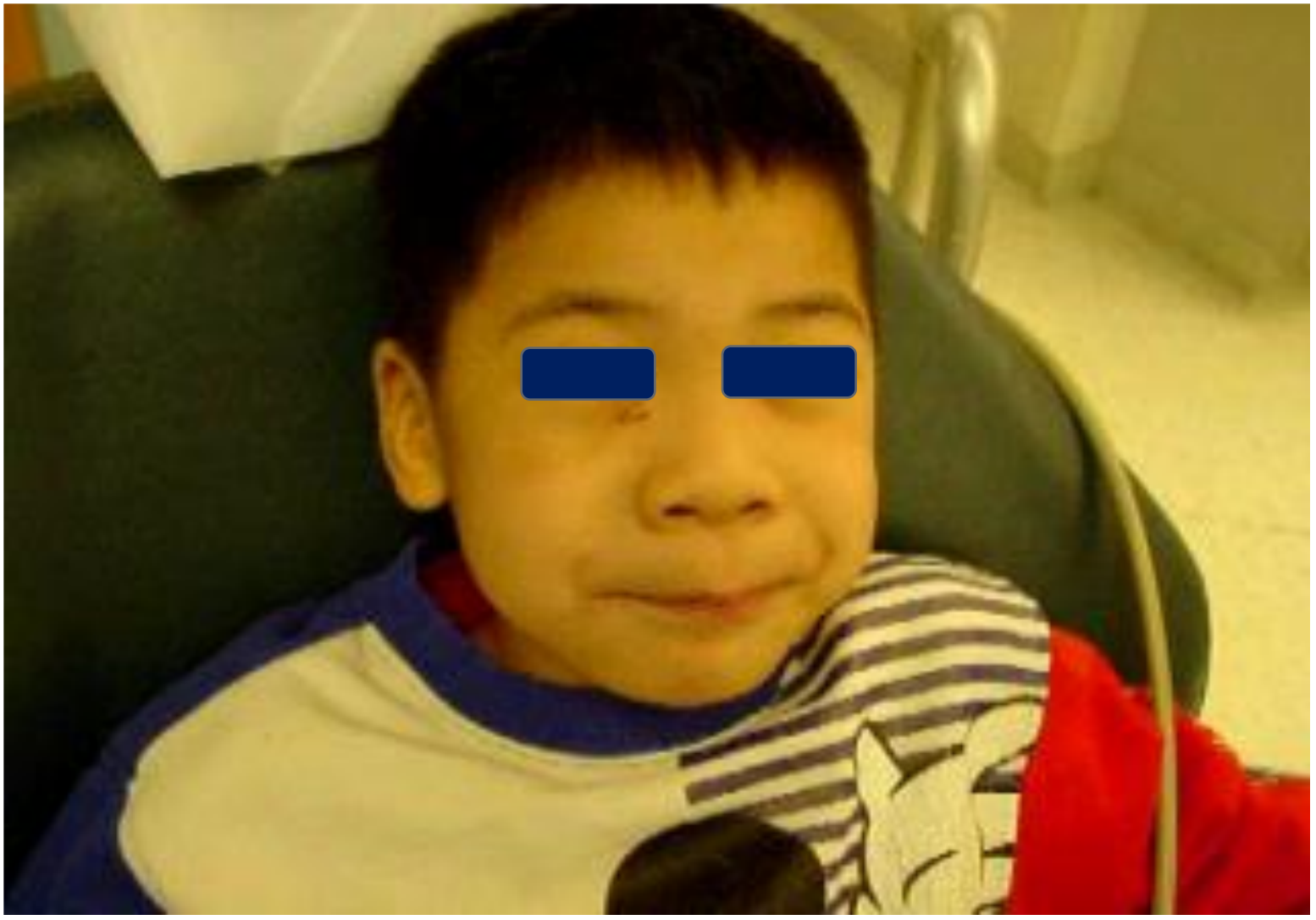
- Complications with GA (first 24 hours):
  - 95% experienced pain or agitation postoperative
  - Difficult intubation = more Naso-pharyngeal pain
  - 40 % mouth discomfort
  - 40% swelling of the mouth
  - 26% toothache
  - 25% bleeding from the mouth
  - 20% had problem eating

"Complications Within the First 24 Hours after Dental Rehabilitation under General Anesthesia", Chris Mayeda. Stephen Wilson, Pediatric Dentistry, 2009.

"Postoperative Pain and Other Sequelae of Dental Rehabilitations Performed on Children Under General Anesthesia" H. Needleman, S. Harpavat, S. Wu, E. Allred, C. Berde, Pediatric Dentistry, 2008

Post-operative Follow up in the clinic:



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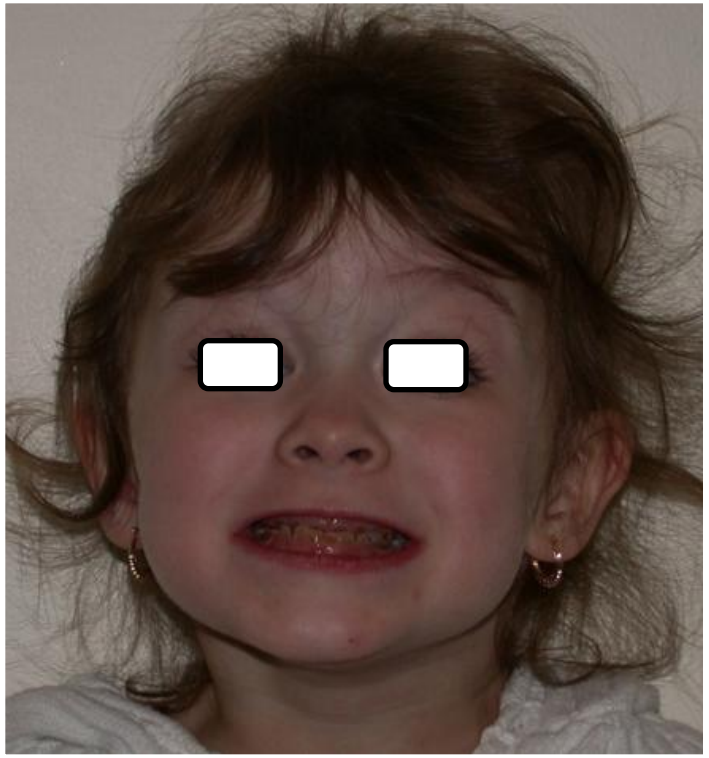

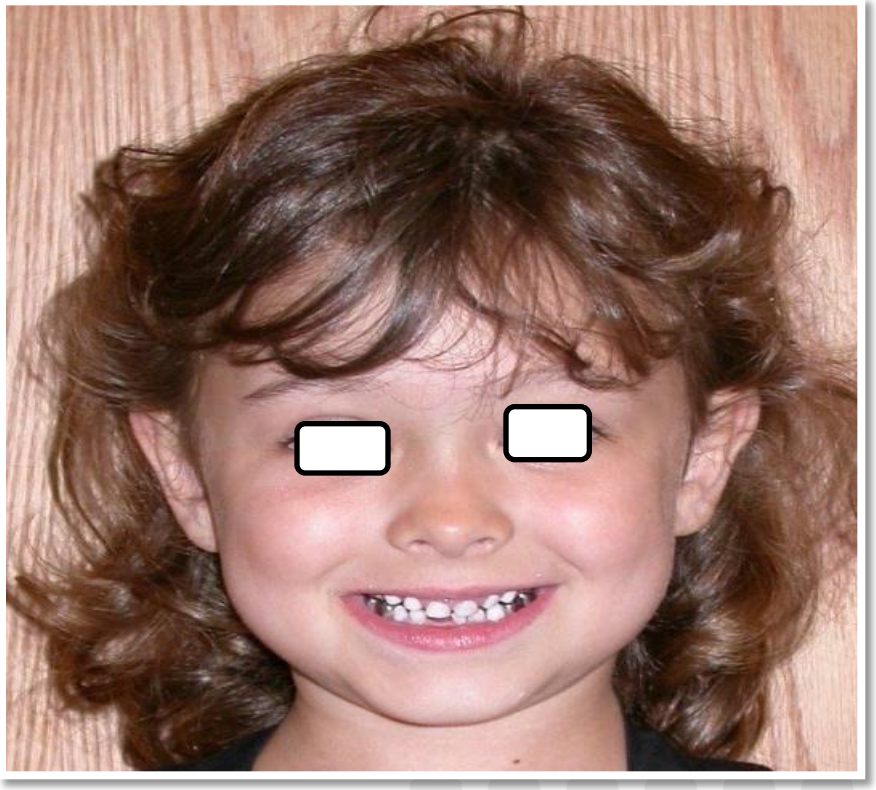

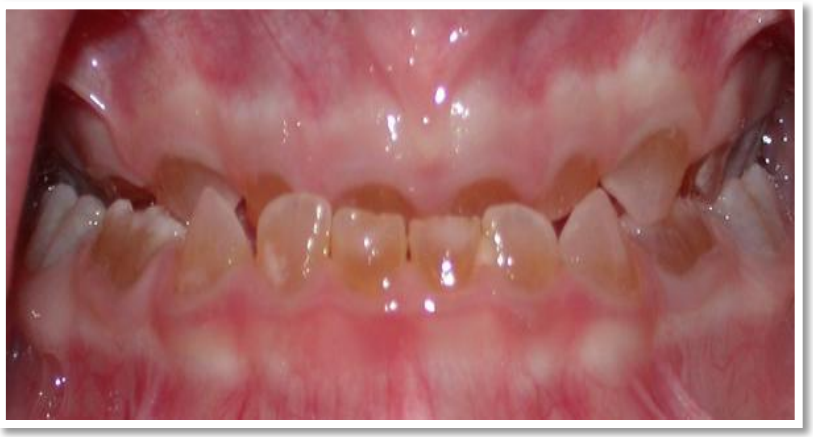

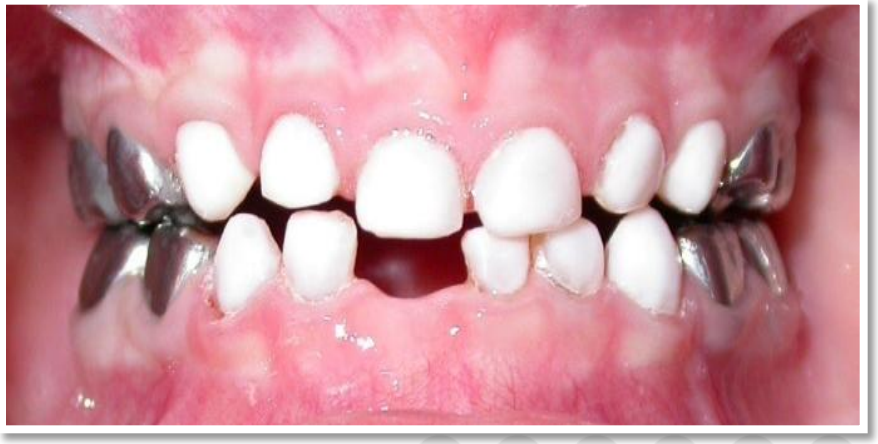

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Questions?

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