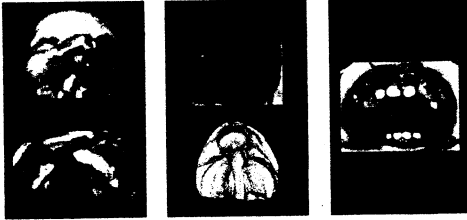


Principles of Speech-Language Pathology for Children with Cleft Lip and Palate:
The Relationship Between Surgery and Speech

The Interaction of
Speech/Language and Surgical Professionals
in Cleft Palate Management



Jeffrey L. Marsh, MD
Medical Director
Cleft Palate and
Craniofacial Deformities Institute



Contact:

Jeffrey L. Marsh, MD
Pediatric Plastic Surgery
St. Louis Children's Hospital
One Children's Place
St. Louis MO 63110 USA

E-Mail: marshj@msnotes.wustl.edu

FAX USA 314-361-4571

Principles of Speech-Language Pathology for Children with Cleft Lip and Palate:
The Relationship Between Surgery and Speech

Speech Considerations for the Cleft Palate Surgeon


1. Initial Palatoplasty
2. Secondary Management Velopharyngeal Dysfunction
3. Maxillary Advancement

Decision Making for the Cleft Palate Surgeon

1. **Tradition of Professor or Unit**
2. **Influence of Colleagues**
 - scientific meetings
 - medical literature
 - multidisciplinary cleft team
3. **Personal Research**
 - retrospective outcome analysis
 - prospective human studies
 - animal investigations

Value of the Multidisciplinary Team

- Expanded expertise
- Alternative perspectives

Medical / Surgical <ul style="list-style-type: none">• Pediatrics• Genetics• Nursing• Plastic Surgery		Psychosocial <ul style="list-style-type: none">• Psychology/Psychiatry• Social Work• Patient Coordinator
---	---	---

What can the cleft palate surgeon learn from Speech-Language Pathology colleagues?

- Surgical timing with respect to speech-language development
- Efficacy of technique with respect to velopharyngeal function
- Risk of surgery with respect to velopharyngeal function

Variables in Palatoplasty

- Technique
- Timing
- Sequencing

Variables in Palatoplasty

- Technique
 - prosthetic
 - surgical
- Sequencing
 - hard palate
 - soft palate
- Timing
 - before babble
 - before true speech
 - after true speech

Unrepaired Cleft Palate Management: Technique

	prosthetic obturation	surgery
static separation of nasal and oral cavities	+/-	+
dynamic separation of nasal and oral pharynges	-	+/-
minimization of secondary dentoskeletal deformation	+	-

The Impact of Cleft Palate Management on Speech Cleft Palate Surgical Techniques

- separation of oral and nasal cavities
- velar lengthening
- velar muscle repair
- ↓ VP port with 1° palatoplasty

Unrepaired Cleft Palate Management: Sequencing

	hard palate	soft palate
synchronous	+	+
metachronous	1st	2nd
metachronous	2nd	1st

Unrepaired Cleft Palate Management: Timing

- before babble
- before true speech
- after true speech

Question:

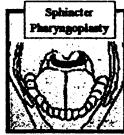
What is the relationship between the neurological development of speech and palatoplasty?

Management of Velopharyngeal Dysfunction: Surgery

Clinical Problem

Some cleft palate patients have velopharyngeal dysfunction unresponsive to speech therapy following palatoplasty.

Methods of Velopharyngeal Management



Management of Velopharyngeal Dysfunction: Surgery

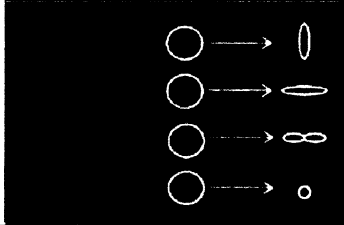
Velopharyngeal Dysfunction Management Team

- Speech / Language Pathology
- Otolaryngology
- Prosthodontics
- Plastic Surgery

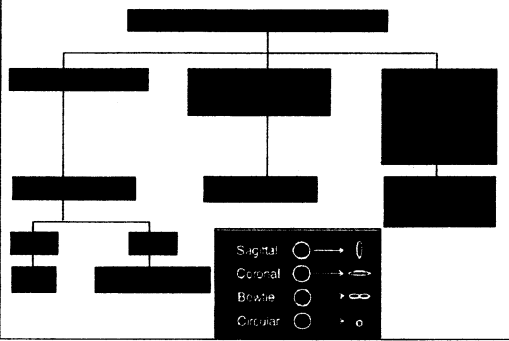
Principles of Speech-Language Pathology for Children with Cleft Lip and Palate:
The Relationship Between Surgery and Speech

Differential Management of Velopharyngeal Dysfunction based on Differential Diagnosis

Endoscopic Velopharyngeal Closure Patterns



Velopharyngeal Management Algorithm



Principles of Speech-Language Pathology for Children with Cleft Lip and Palate:
The Relationship Between Surgery and Speech

The VP Management Dilemma



**Secondary Reconstruction:
Dentoskeletal and Soft Tissue**



Outcome Assessment

Outcome Assessment: Cleft Palate Surgery

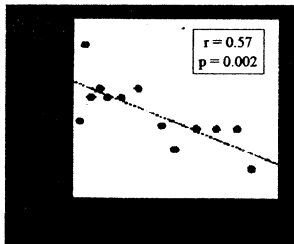
- physical integrity of the palate
- functional integrity of the palate
- normalcy of dentoskeletal development
- normalcy of upper airway

Functional Integrity of the Palate

- Swallowing
- Speech (velopharyngeal function)

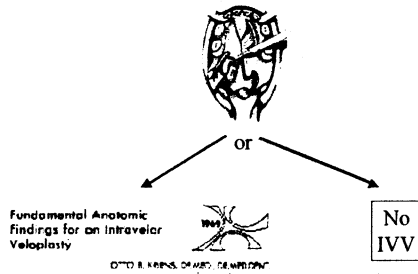
Learning Curve?

Affect of Cumulative # of Palatoplasties
by One Surgeon on Velopharyngeal Management



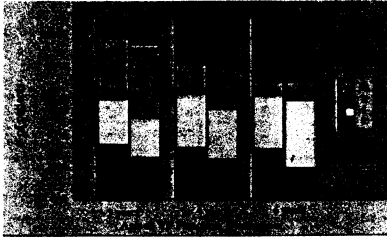
IVV (Kriens) versus non-IVV

Testing the IVV Hypothesis: Study Design



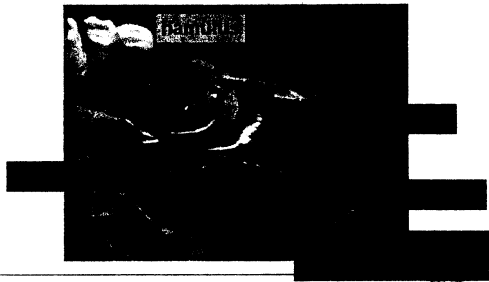
IVV versus non-IVV (Aug '97 update)

**Velopharyngeal Function Outcome
by Management**

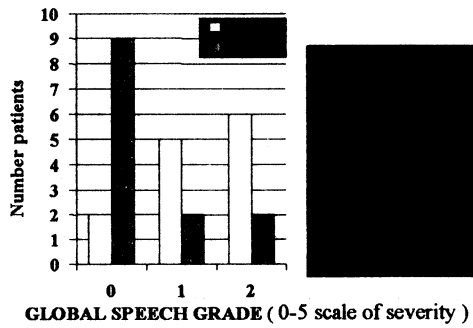


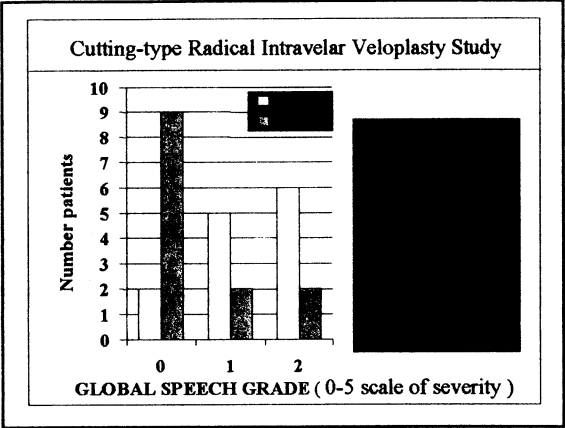
**Principles of Speech-Language Pathology for Children with Cleft Lip and Palate:
The Relationship Between Surgery and Speech**

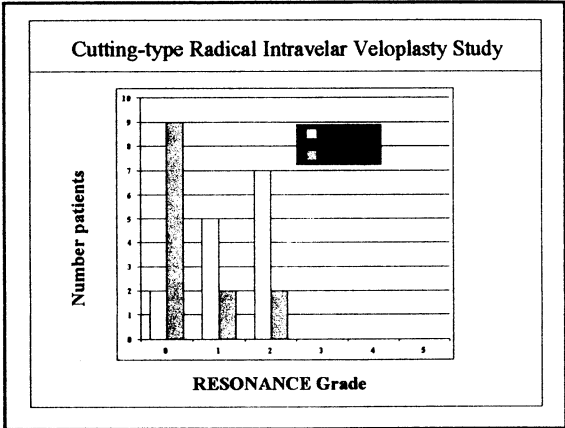
"Cutting" Intravelar Veloplasty

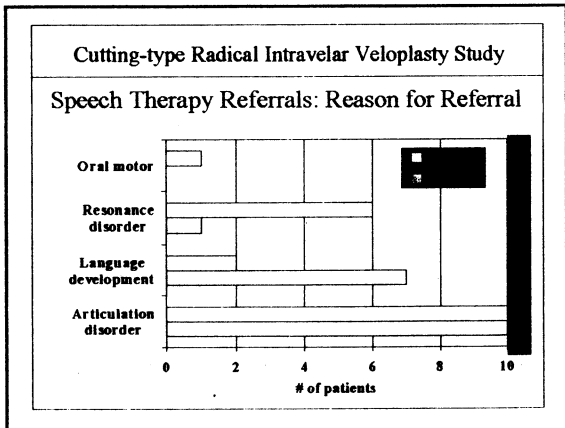


Cutting-type Radical Intravelar Veloplasty Study









Outcome Assessment of VPI Management

- **What to assess?**
- **Definition of "success"**
- **How to assess?**
- **Who should assess?**

Outcome Assessment of VPI Management

- **Who should assess?**
 - not professional performing treatment
 - intra versus extra-mural
 - professional versus laity

Speech outcome following palatoplasty in primary school children: Do lay
peer observers agree with speech pathologists? *Plast Reconstr Surg* 96:958-
965, 1996.

Outcome Assessment of VPI Management

- **What to assess?**
 - perceptual speech
 - anatomic function
 - § speech
 - § breathing
 - § swallowing

Outcome Assessment of VPI Management

- How to assess?

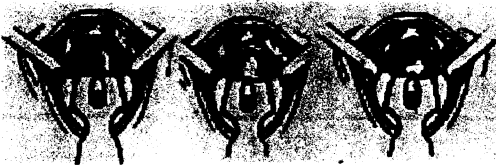
- perceptual
- instrumental
 - § medical imaging
 - § endoscopy
 - § acoustics
 - § aerodynamics

Outcome Assessment of VPI Management

- Definition of "success"

- resolution of problem =
normal speech nasal resonance
- absence of morbidity =
 - § no residual VPI
 - § no denasality
 - § patent nasal airway
 - § no sleep apnea

Sphincter Pharyngoplasty Technique



Cleft Palate-Craniofacial J 33:184, 1996

**Comparison of Outcome
Sphincter Pharyngoplasty (n=123)
and Pharyngeal Flap (n=65):**

- 1° success [SP= 84%; PF= 80%]
- 2° salvage* [SP= 97%; PF= 92%]
- 3° salvage* [SP=100%; PF=100%]

* nasal airway obstruction

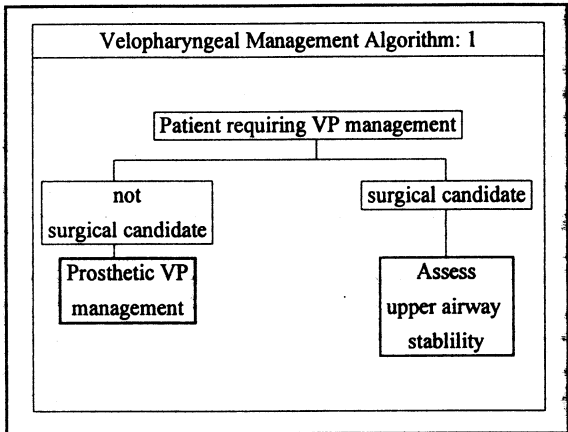
Salvaging the Failed Pharyngoplasty: Intervention Outcome.
Cleft Palate-Craniofacial J 35:447-453, 1998.

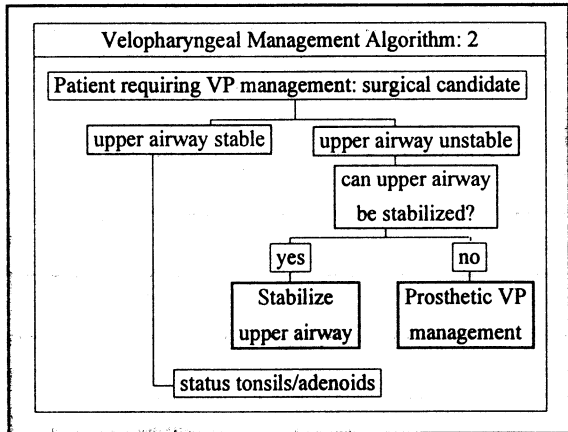
The goal for the baby with cleft lip / palate
is for that individual to function in society
as if the cleft had not happened

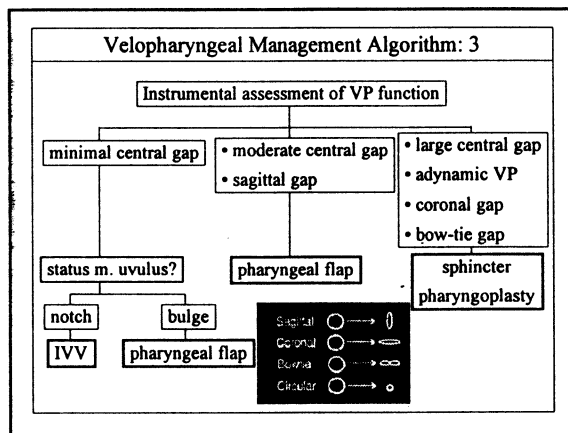


+ 18 years →

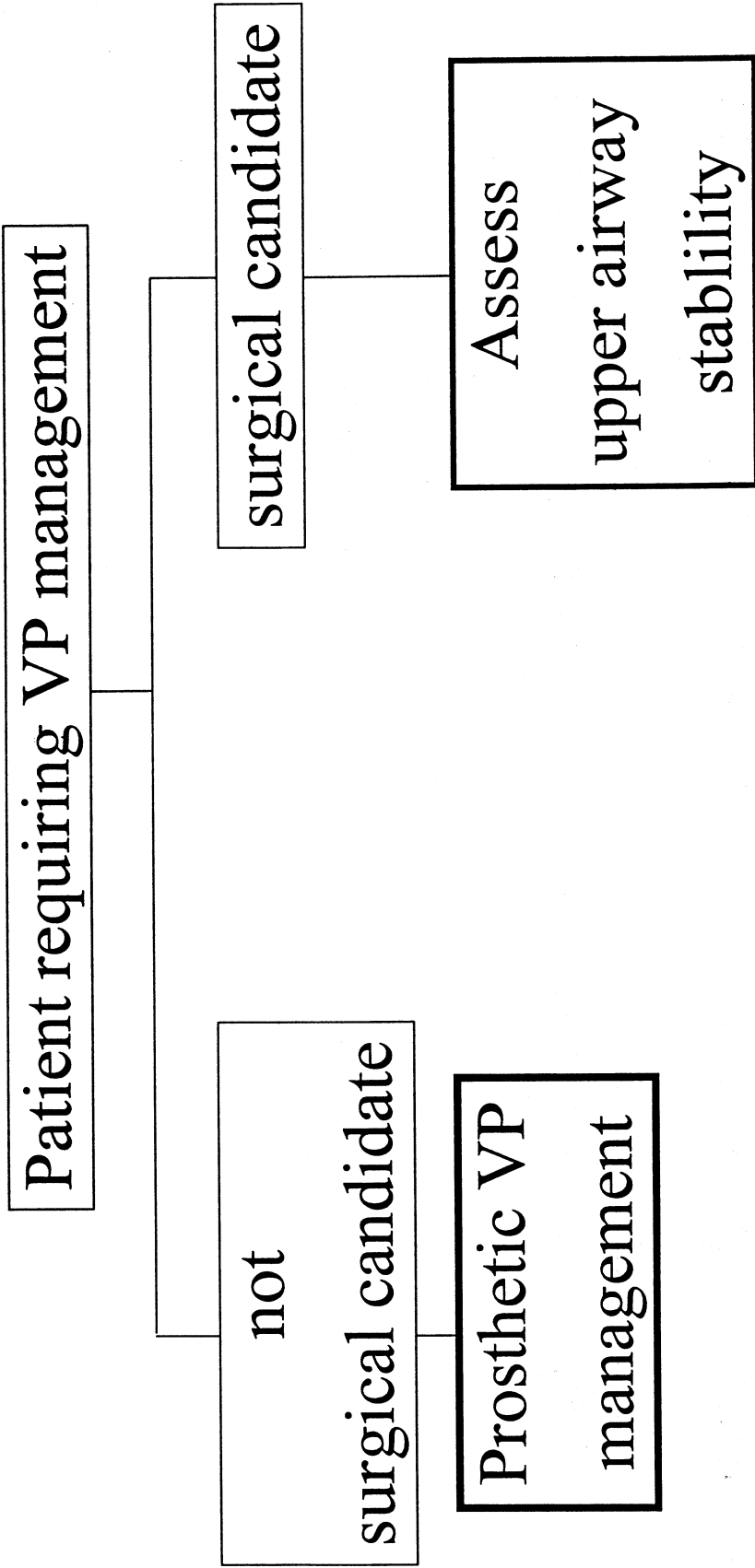








Velopharyngeal Management Algorithm: 1



Velopharyngeal Management Algorithm: 2

Patient requiring VP management: surgical candidate

upper airway stable

upper airway unstable

can upper airway
be stabilized?

yes

Stabilize
upper airway

status tonsils/adenoids

no

Prosthetic VP
management

Velopharyngeal Management Algorithm: 3

Instrumental assessment of VP function

minimal central gap

- moderate central gap
- sagittal gap

- large central gap
- adynamic VP
- coronal gap
- bow-tie gap

status m. uvulus?

notch

IVV

bulge

pharyngeal flap

pharyngeal flap

sphincter
pharyngoplasty

