

# **Videofluoroscopic Swallow Study (VFSS)**

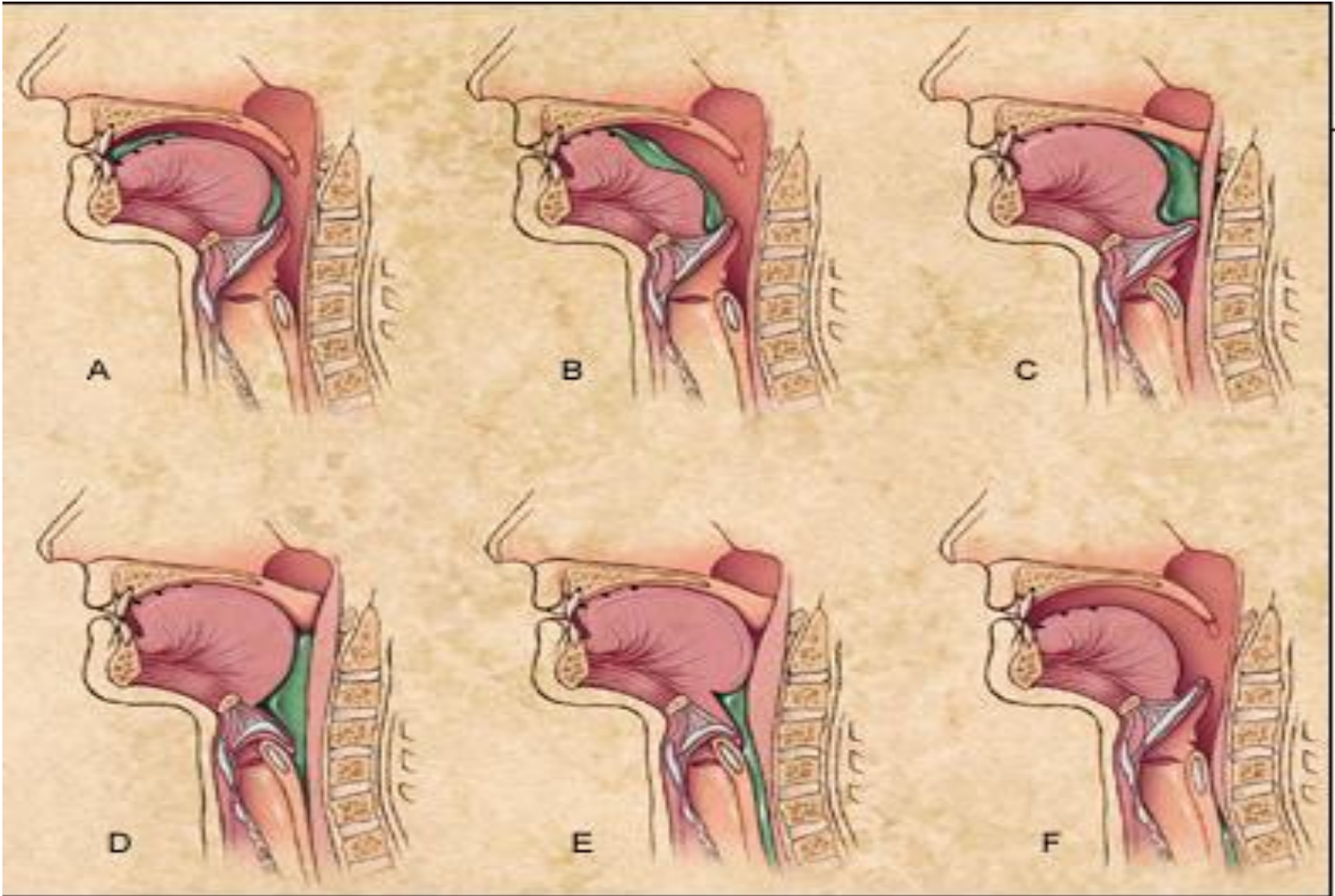
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**Rehabilitation Centre**

**KK Women's and Children's Hospital**





# The normal swallow



# Clinical Bedside Examination



# What is Videofluoroscopic Swallow Study (VFSS)?

- Also known as modified barium swallow exam (MBS), or "speech swallow exam",
- A real-time x-ray "movie x ray"
- Noninvasive
- Barium: contrast material
- Patient will eat and drink controlled amounts of foods and liquids in a variety of consistencies





# Uses of VFSS



- Gold standard for studies on swallowing disorders,
- Evaluate a patient's ability to swallow safely and effectively
- Determine fluid consistencies and food texture that a patient can most safely consume
- Evaluate the nature of dysphagia



# Indications for VFSS

- Coughing and/or choking while eating or drinking
- Drooling
- Swallowing with wet-sounding voice
- Changes in breathing when eating or drinking
- Frequent respiratory infections known or suspected aspiration pneumonia
- Masses on the tongue, pharynx or larynx
- Muscle weakness, or myopathy, involving the pharynx
- Neurologic disorders likely to affect swallowing.



# Videofluoroscopy Videos



# Videofluoroscopy Videos





# Risks

- Exposure to radiation
- Allergy to barium
- Aspiration of barium



# Risk Management

- Evaluate if the benefits of the assessment outweighs the risk
  - Better understanding of the physiology of the swallow
  - Better recommendations (safer swallows, better quality of life)
- Screening time :5 mins
  - Fluoroscopy time does not typically exceed 5 mins (ASHA, 2004)
  - VF done for a mean of 4.76 mins -> mean of 0.4mS (Wright et al., 1998)



# Radiation Info

Table 2. Effective dose in common radiological procedures

Examination	Effective dose (mSv)
Chest x-ray	0.04
Lumbar spine x-ray	2.2
Barium meal (upper GI series)	4.6
Barium enema	8.7
Pharyngeal VTF (our data)	0.4

Chest X-ray	0.1 mSv
Average background exposure in one year	3 mSv
Abdominal X-ray	4 mSv
Living on the Colorado Plateau for one year	4.5 mSv
Typical yearly dose for a uranium miner	5-10 mSv
Full-body CT scan	10 mSv



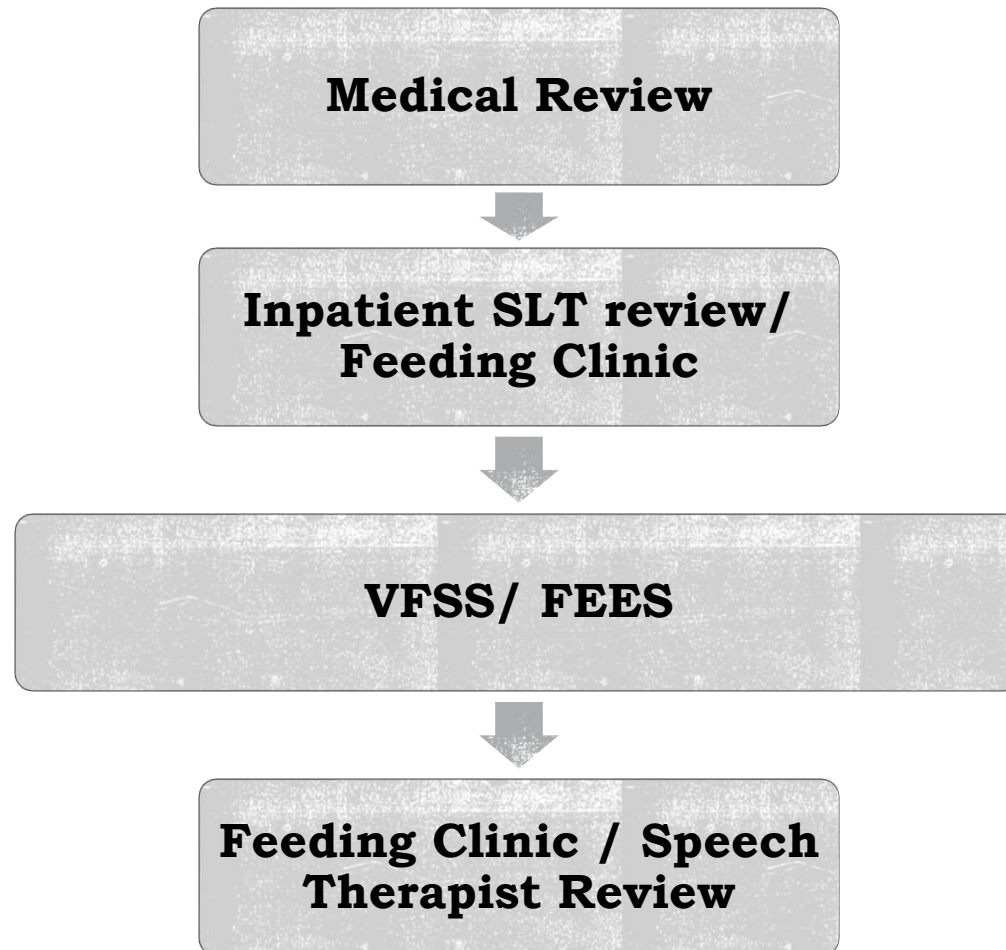
**Table 2** Screening time, kVp, DAP and effective dose for the three age groups and the total group

	≤1.0 years (n=35)	>1.0–3.0 years (n=30)	>3.0 years (n=25)	All (n=90)	<i>P</i> value <sup>a</sup>
Screening time (min)					0.490
Mean	2.52	2.57	2.32	2.47	
SD	0.78	0.77	0.91	0.81	
Range	0.80–4.60	1.00–4.10	0.80–3.80	0.80–4.60	
kVp					0.164
Mean	66.7	65.0	64.5	65.5	
SD	3.9	5.3	5.3	4.7	
Range	55–74	55–76	50–75	50–76	
DAP (cGy cm <sup>2</sup> )					0.172
Mean	25.80	28.73	33.04	28.79	
SD	10.20	16.23	17.50	14.72	
Range	10.00–44.00	3.00–80.00	8.00–86.00	3.00–86.00	
Effective dose (mSv)					0.001
Mean	0.12	0.07	0.05	0.0826	
SD	0.06	0.04	0.05	0.0544	
Range	0.04–0.26	0.01–0.14	0.01–0.12	0.0027–0.2542	

<sup>a</sup>Significance levels reported are for the total group only.



# Referral Process



# Where is VFSS done?

- Diagnostic Imaging – Level 1, Children’s Tower



# What do parents/caregivers do during VFSS?

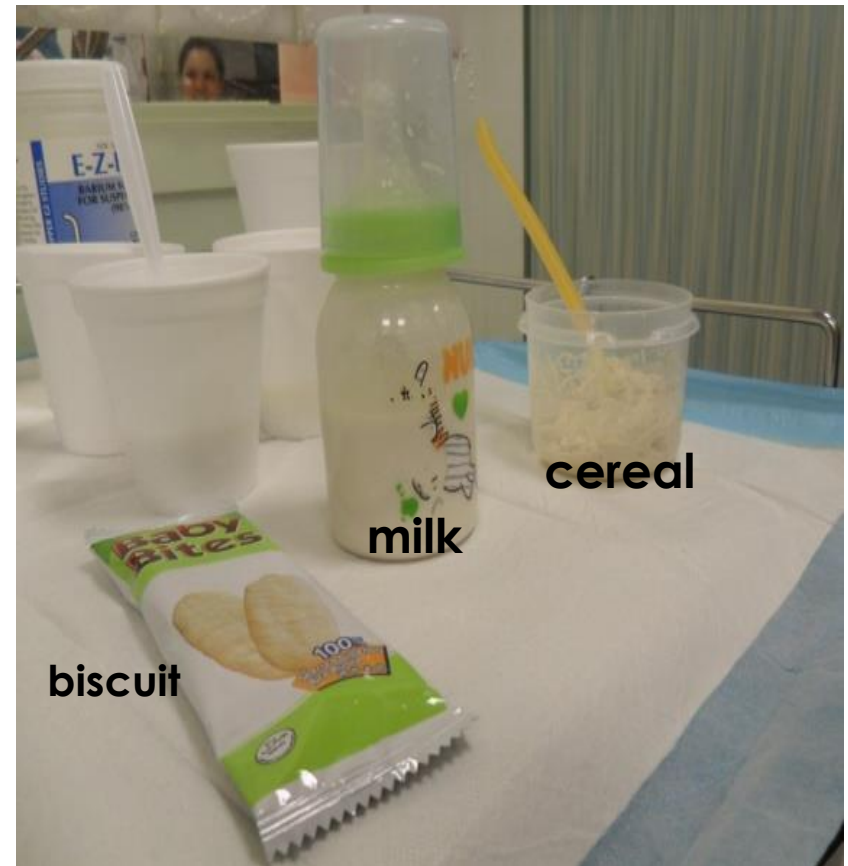
- Only one care giver allowed in the room
- Caregiver will assist with feeding
- Therapist will review the images/ video with parents after the procedure





# How is VFSS done?

- Barium
  - Radio-opaque bolus
  - Amount according to child's age
- Feeding trials
  - Solids (puree)
  - Fluid (water)
- Modes of feeding (spoon, bottle)
  - Seldom chewing
- 5 min screening time
- 30-45 minutes for the whole procedure



# Types of seating



# Reporting VFSS- The video



# Reporting VFSS

Allscripts Gateway | My Applications | Acute Care

My Applications > Acute Care > Documents

File Registration View GoTo Actions Preferences Tools

KKH-Diagnostic imaging  
Allergies: No Known Allergies

Patient List Orders Results Results Ack Patient Info Documents **Flowsheets** Clinical Viewer Clinical Summary Active Out-Pt Med RxManager SMR Apps

Options Panel

Chart Selection

This chart  All available charts

Date Range

Authored Date

From: 25-Feb-2019

To: [ ]

Retain selections for next patient

Display Format: Date (Report)

Filters

Document Status/Priority: No Document Status/Priority Filter

Document Selection: No Document Selection Filter

Type/Category: No Type/Category Filter

Signature Status: No Signature Status Filter

Revision Status/Author: No Revision Status/Author Filter

Display Styles

Display View: Report

Group by: Date

Ascending  Descending

Display Format View By Group Reset Modify Append Unfinalize Cancel / Delete Sign Forward View Time Interval Preview Select Grid Columns Options Previous Next

All Documentation for All Available Charts for Authored Document dates from 25-Feb-2019 to Unspecified Display Format Date (Report): Group by: Date

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2 Document(s) shown

Time	Document Name	Documen	Revisio	Signature Sta	Docum	Last Updated By	Last Updated On	Authored	Signed	Co-Signer(s)
- 27-Feb-2019										
13:00	ST Correspondence K...	Complete	Revised	Signed in Full	General	[ ]	27-Feb-2019 15:30	[ ]	27-Feb-2019 15:30	[ ]
- 26-Feb-2019										
16:06	Procedure Note KKH...	Complete	Not Re...	Signed in Full	General	[ ]	26-Feb-2019 17:06	[ ]	26-Feb-2019 16:27	[ ]

Sidebar

KKHSWL180524-S [Citrix] SHSCTX1VPXA45D (8.2.450.10005) SHSSCMVPHC02 Goh, Siew Li (Speech Therapist) 04/03/2019 15:34 000:20 pSCMD8

# Reporting VFSS Findings

- Oral Skills
  - Sucking Skills
  - Chewing Skills (seldom)
  - Bolus formation
  - Tongue base retraction
- Pharyngeal Skills
  - Swallow initiation
  - Laryngeal elevation/ anterior excursion
  - Pharyngeal contraction
  - Velopharyngeal contraction
  - Adequacy of airway protection
- Upper Oesophageal Phase



# References

1. ASHA. (2011). Videofluoroscopic swallow study (VFSS)
2. Mayo Clinic. (2011). Dysphagia
3. Children's Hospital Boston. (2007). Videofluoroscopic swallow study
4. Video Fluoroscopic Swallowing Exam (VFSE) 2019 RadiologyInfo.org , retrieved from <https://www.radiologyinfo.org/en/pdf/modbariumswallow.pdf>
5. Rugiu, M. G. (2007). Role of videofluoroscopy in evaluation of neurologic dysphagia. *Acta Otorhinolaryngologica Italica*, 27(6), 306.
6. JENNIFER, C. D., & MIKOTO, B. (2000). Evaluation and treatment of swallowing impairments. *Am Fam Physician*, 61(8), 2453-2462.







**THANK YOU!**

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