

Innovation from Variation

The Future of Obstetric Anesthesia & Analgesia

Obstetrical Anesthesiologists Intensivists Association
2016 Annual Meeting, St. Petersburg, Russia



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Department of Anesthesiology, Perioperative &

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Innovation from Variation

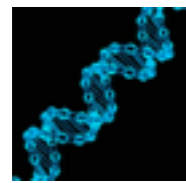
The Future of Obstetric Anesthesia & Analgesia

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2016 Annual Meeting, St. Petersburg, Russia

No Disclosures



Innovation



The Innovator's DNA

Discovery Skill	Definition
Associating	Connecting Across Knowledge Areas
Questioning	Considering New Possibilities
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Dyer J, Gregersen HB, Christensen CM. The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators. Harvard Business Review Press; 2011

BMJ

Sanitation (H2O + Sewage)
Antibiotics
Anaesthesia

Anesthesia
Diabetes
Bone Marrow



Henry Jacob Bigelow: “It has long been an important problem in medical science to devise some method of **mitigating pain of surgical operations**. An efficient agent for this purpose has at length been discovered”

BMJ 2007 Medical Milestones since 1840

NEJM 2012 Most Important Articles since 1812

The introduction of a new idea, method or device

Innovation

A slight difference in a condition, amount, or level

Frederick Augustus III
Elector of Saxony

Count Keyserlingk
Russian Ambassador

Johann Goldberg
Royal Court Composer



Goldberg *Variations*

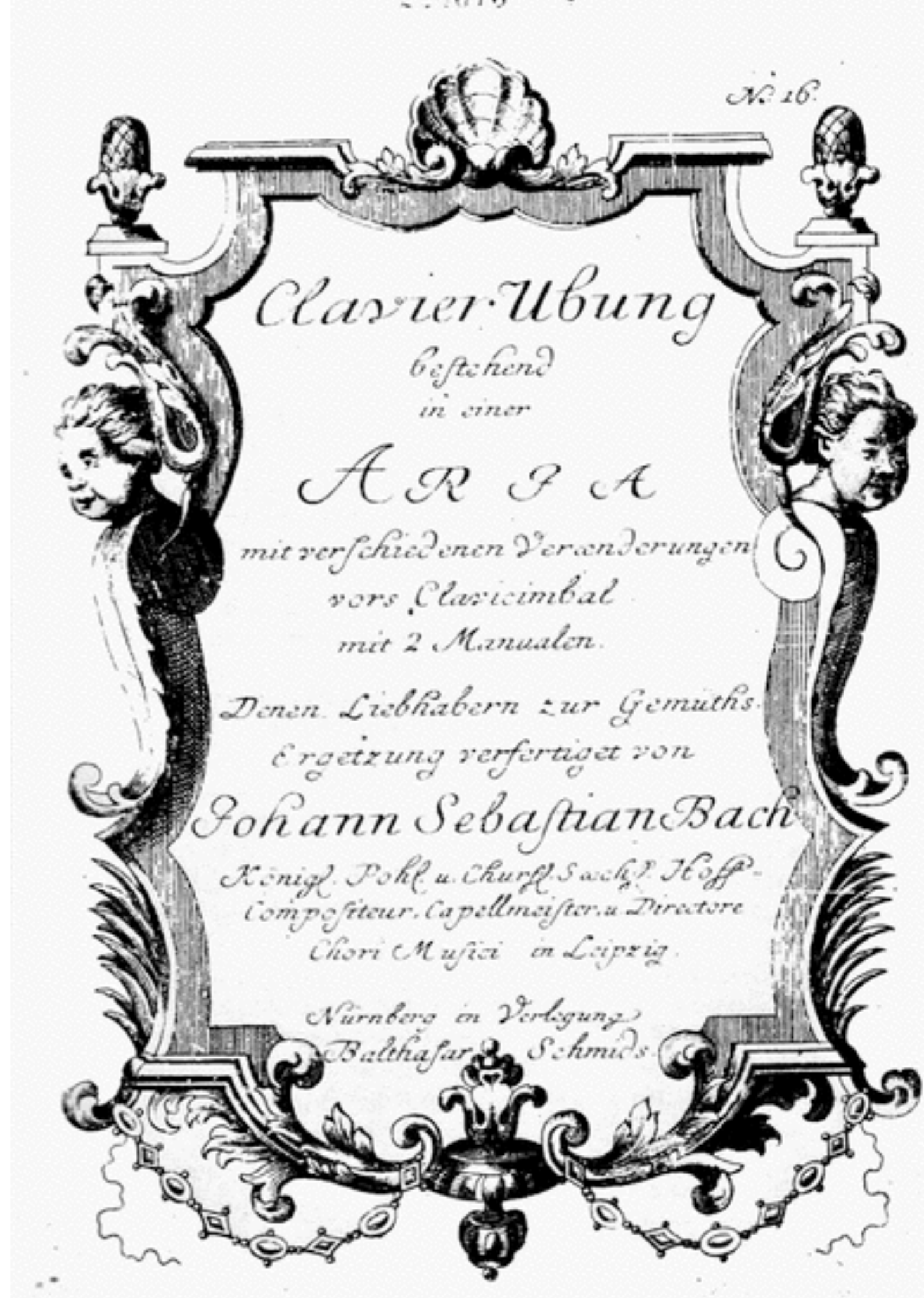
Johann Sebastian Bach

Aria + 30 Variations

Composed 15 yrs, 1741

Harpsichord-2 Manuals

The Model



Goldberg *Variations*

Johann Sebastian Bach

Chromatic Scales

Quasi-Trills

Broken 6th's/3rd's

Chasing Scales





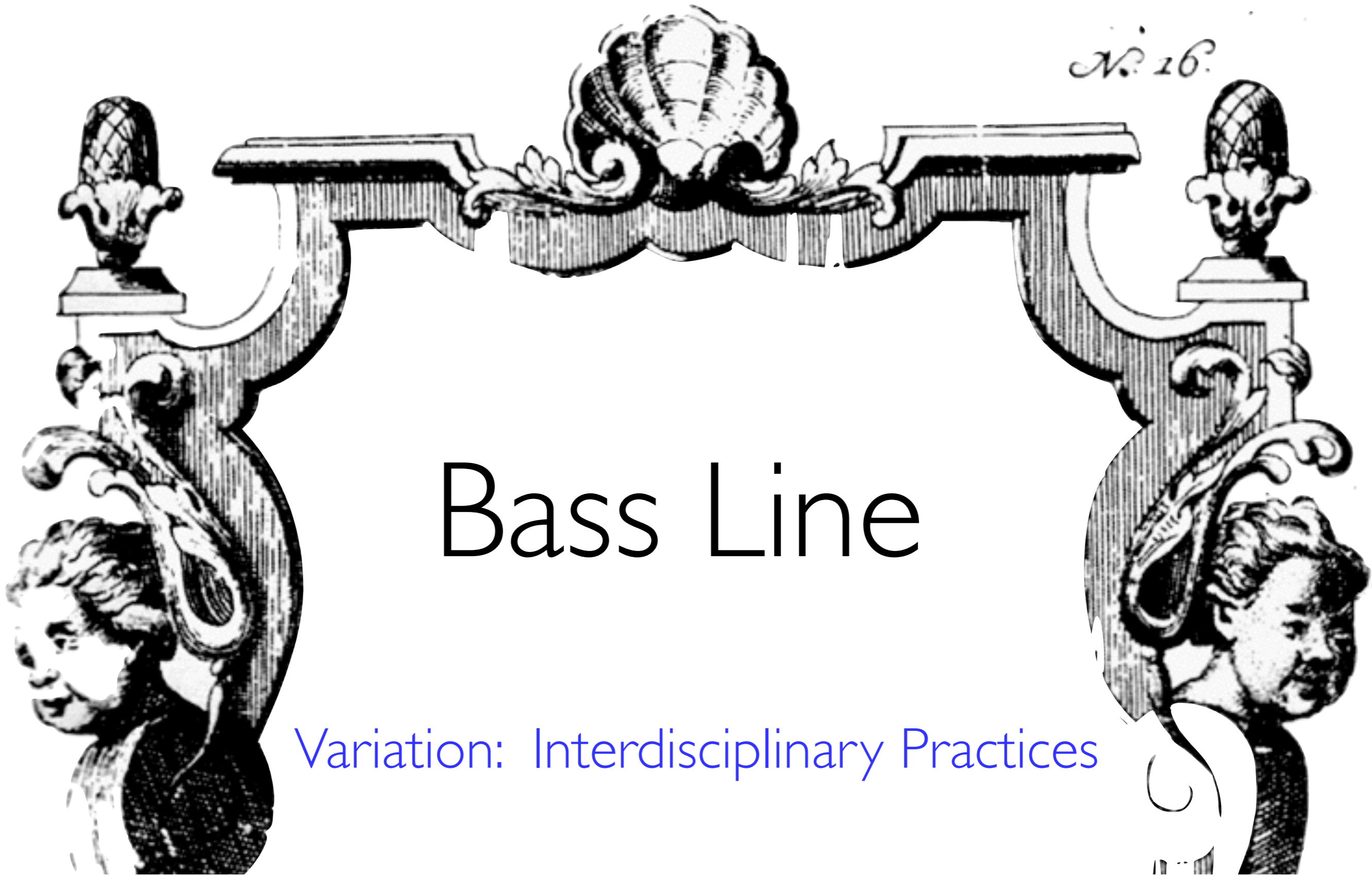
Bass line

Aria

Canon

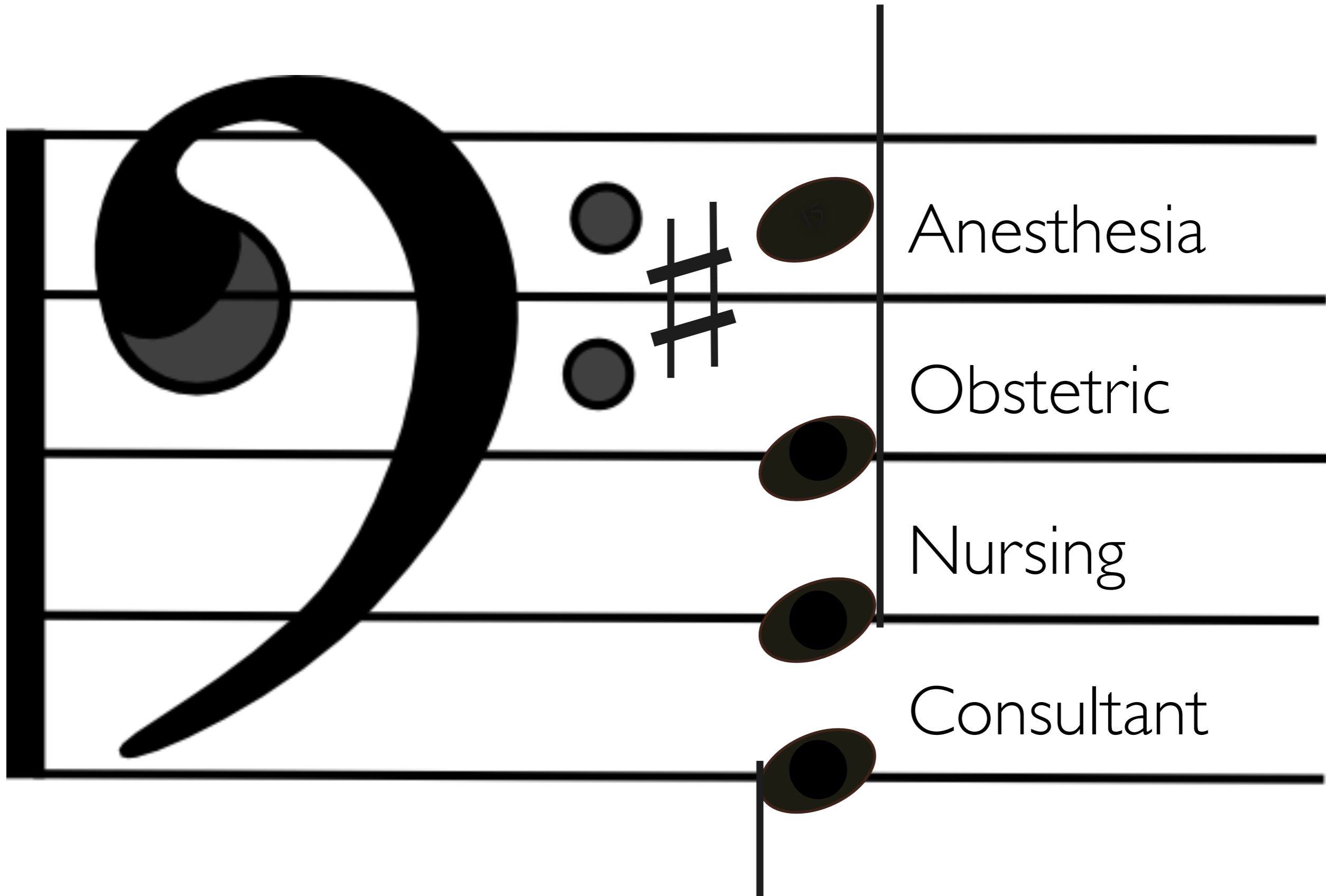
Harpsichord

N.º 16.



Bass Line

Variation: Interdisciplinary Practices



Anesthesia

Obstetric

Nursing

Consultant

Variation-OB Anesthesia

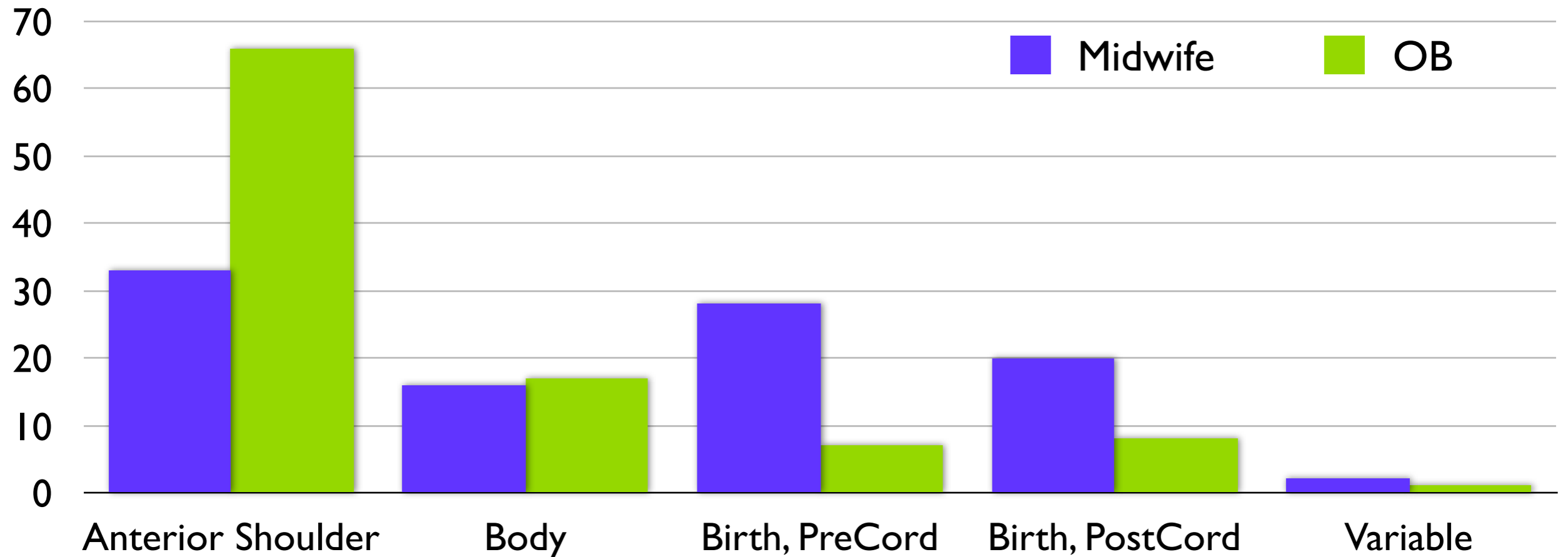
Anesthesia Guidelines
for Cesarean Delivery:
American, British,
Danish, and German

- Labor Analgesia Conversion
- Hypotension Prophylaxis
- PDPH Management
- Aspiration Prevention
- General Anesthesia
- Failed Intubation
- Postoperative Analgesia

Winther LP, et al. Acta Anaesthesiol Scand 2013;57:141-9
Practice guidelines for obstetric anesthesia. Anesthesiology 2007;106:843-63
Bucklin BA, et al. Anesthesiology 2005;103:645-53

Variation-OB

When do you give **uterotonic drug** during 3rd stage?



Variation-Nurse

Presence of **key evidence-based interventions** in obstetric nursing pathway documents, 17 Hospitals

90–100%*

Pulse‡, temperature‡, vaginal loss‡, uterine tone and position‡, bladder function‡, bowel function‡

50–59%

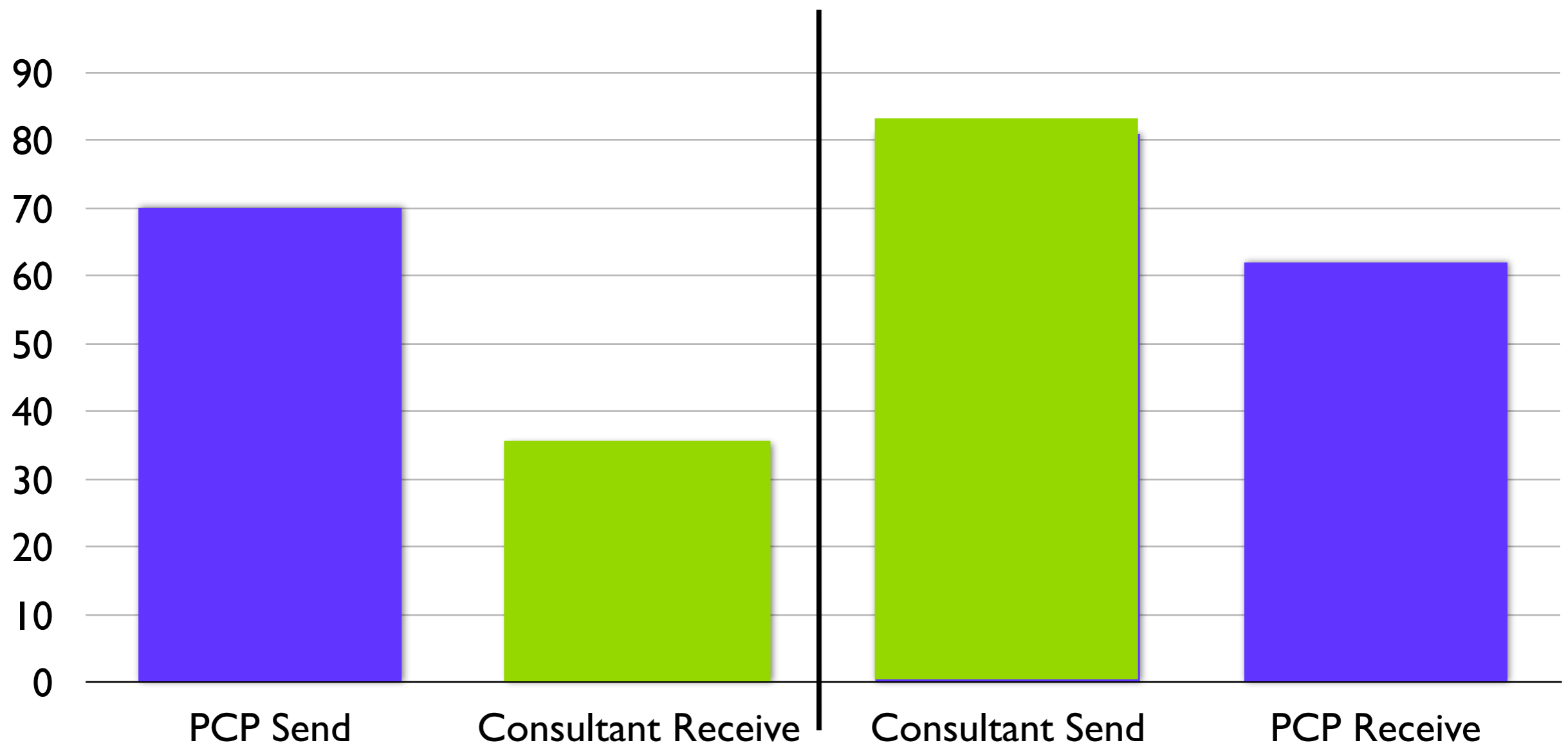
Weight of baby†, number of infant bowel movements†, number of infant urinations†, nipple condition‡

0–9%

Rubella screening‡, postnatal depression‡, headache‡, back pain‡

Variation-Consultants

Nationwide Survey of Consult Quality: 4720 Physicians



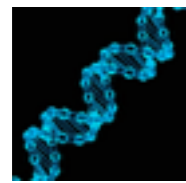
Innovation-Joint Rounds

An “**uninhibited exchange**” of **clinical and cultural points of view** by professionals who share a common interest in serving in a manner that is safe for the **patients** and fulfilling for the **caregivers**. David Acker, MD

- **Daily Interdisciplinary Rounds**
10 am, 10 pm
- **The Pre-Procedure “Huddle”**
- Anesthesiologists, Academic & Private Obstetricians, Midwives, Nurses, Pediatricians, Social Workers, Consultants
- Nurse present patients

Results

- Reduced practice variation
- Improved patient safety
- Increased camaraderie, confidence and respect
- Diminished hierarchy

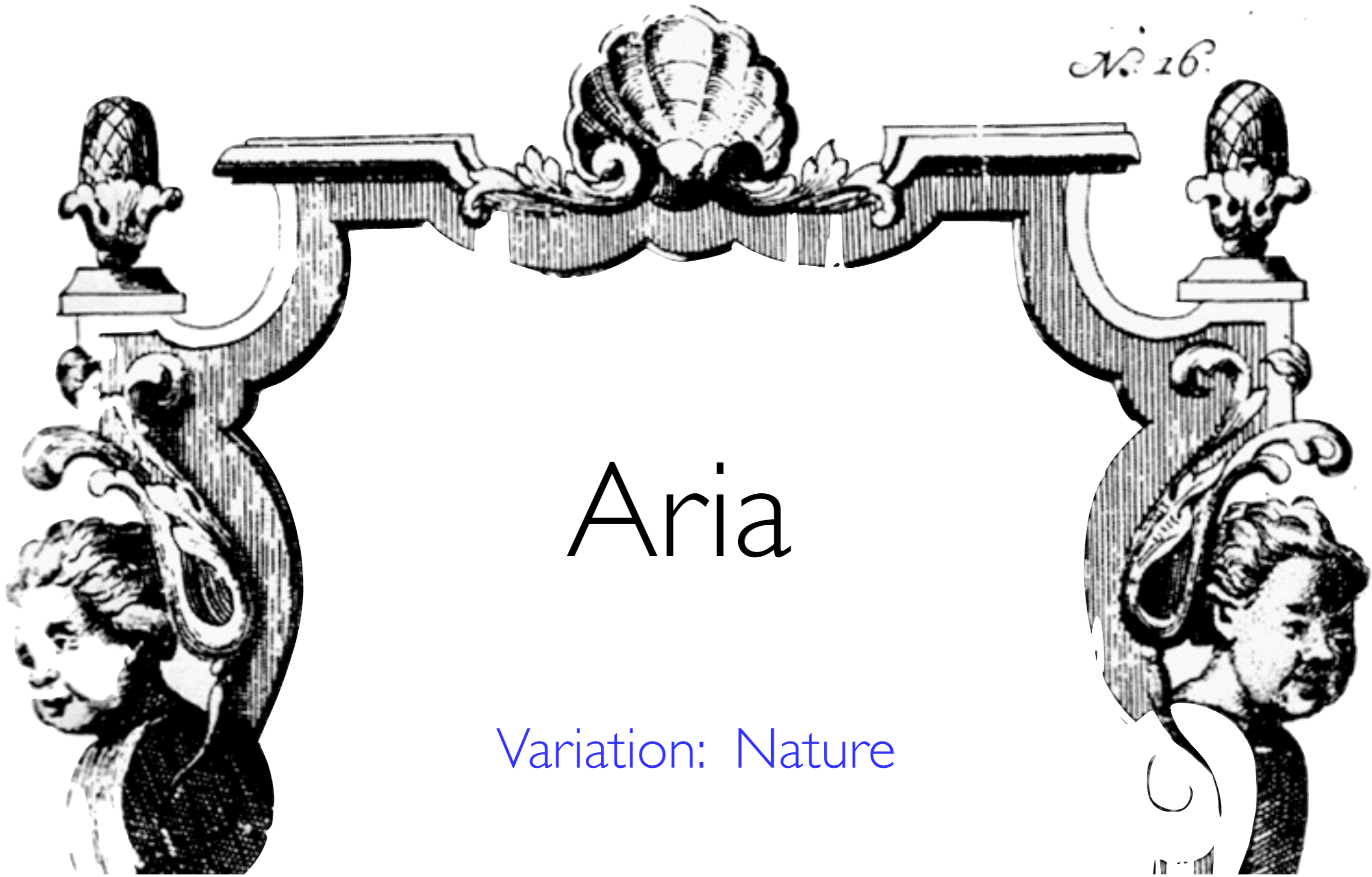


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Aria

Variation: Nature

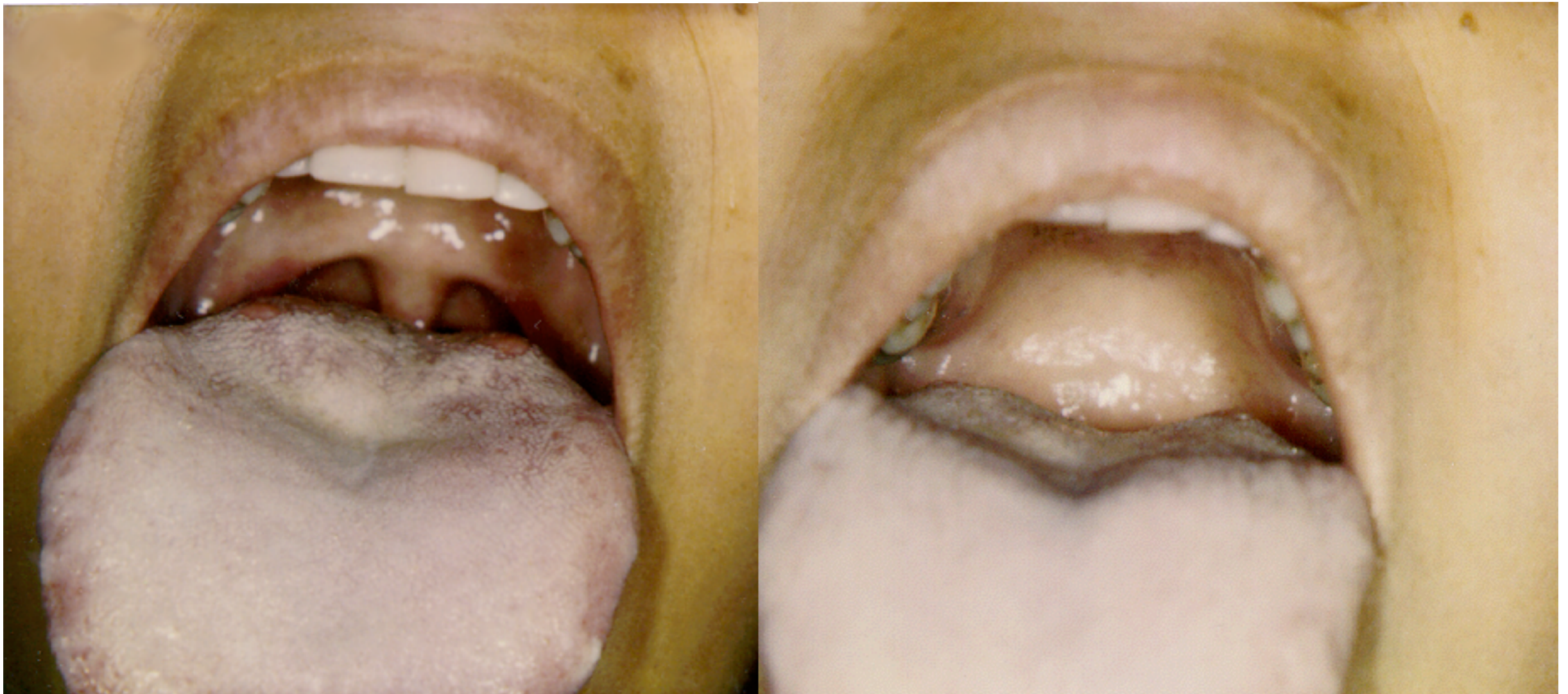
Aria: A piece for **one voice**, usually with orchestral accompaniment

Aria, from the Goldberg Variations

J. S. Bach



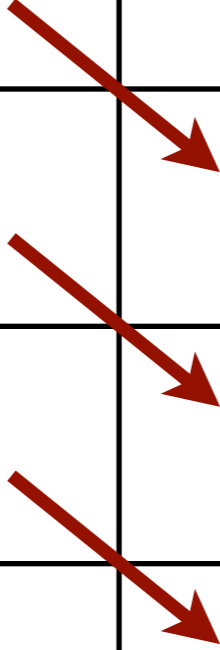
Variation-Pregnant Airway



Valsalva, PIH, Fluid Overload, Oxytocin

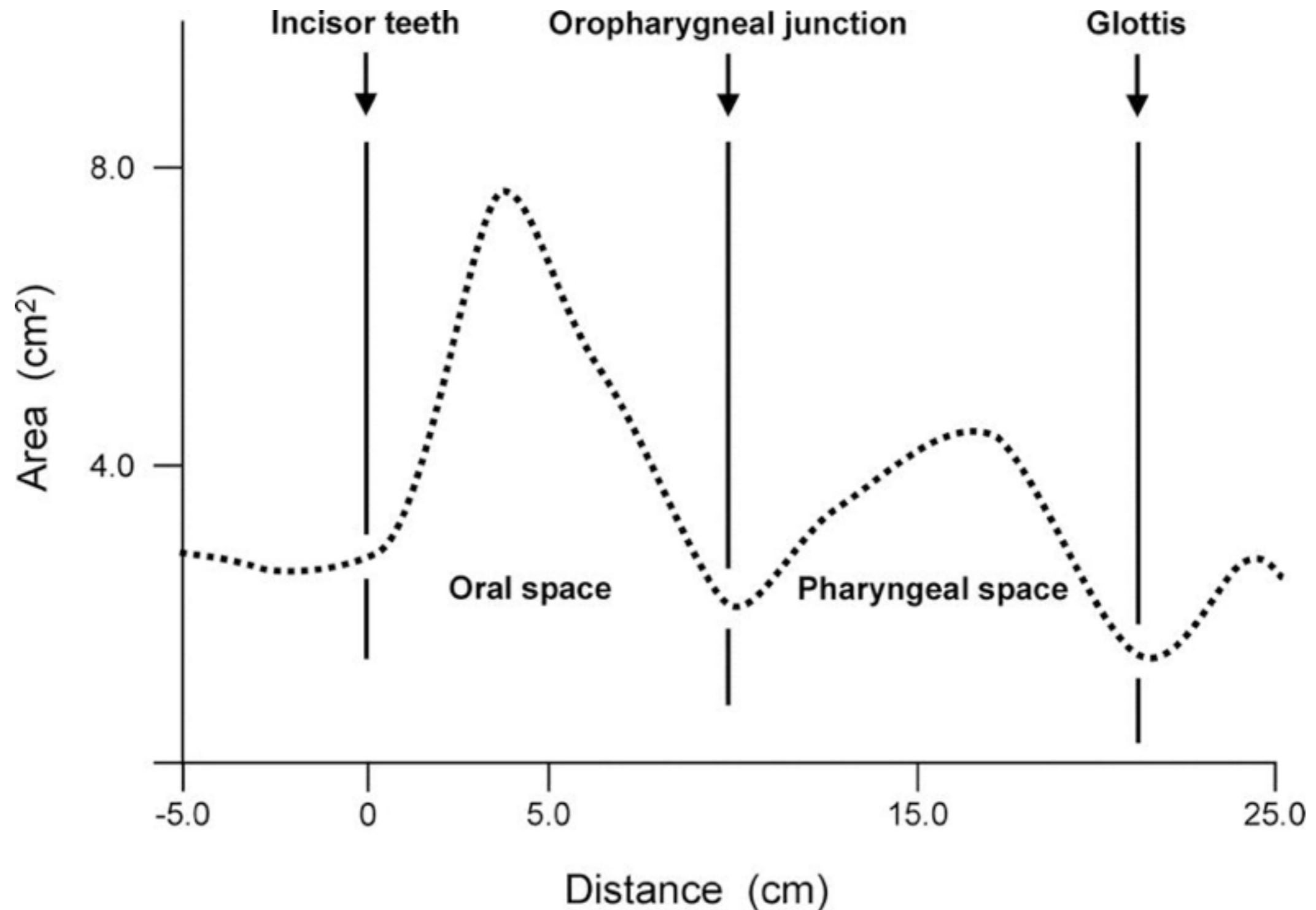
Variation-Pregnant Airway

Classification	Pre Labor	Post Labor
1	9	4
2	35	27
3*	17	22
4*	0***	8



n = 61 *P < 0.001; ** Excluded from initial evaluation

Variation-Pregnant Airway



Variation-Pregnant Airway

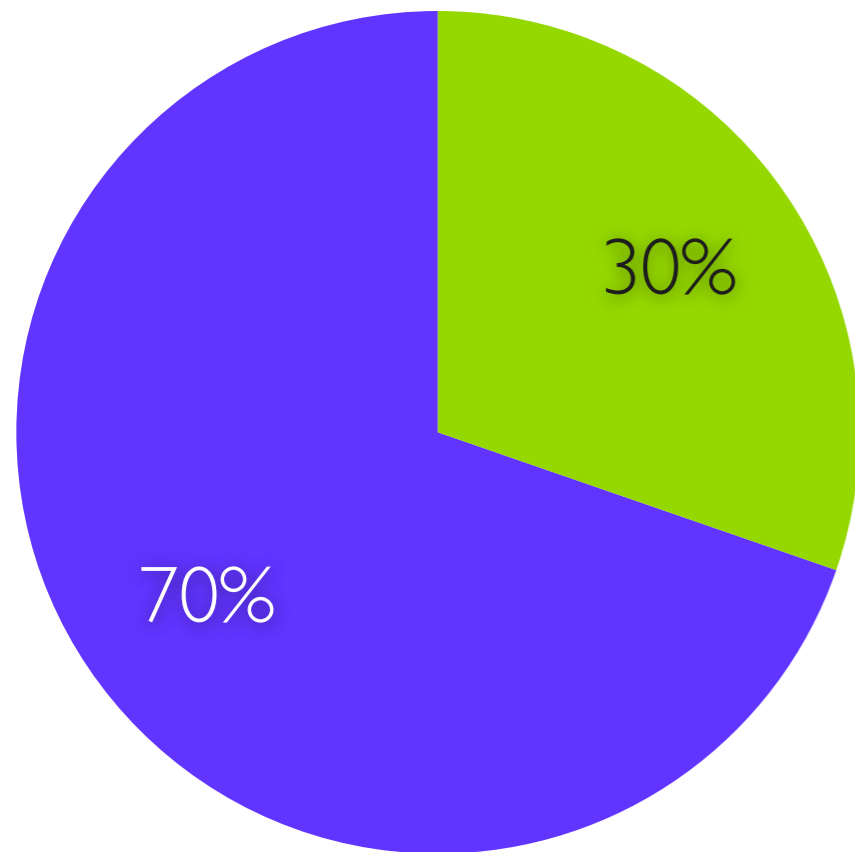
Case fatality ratio

● Regional ● General

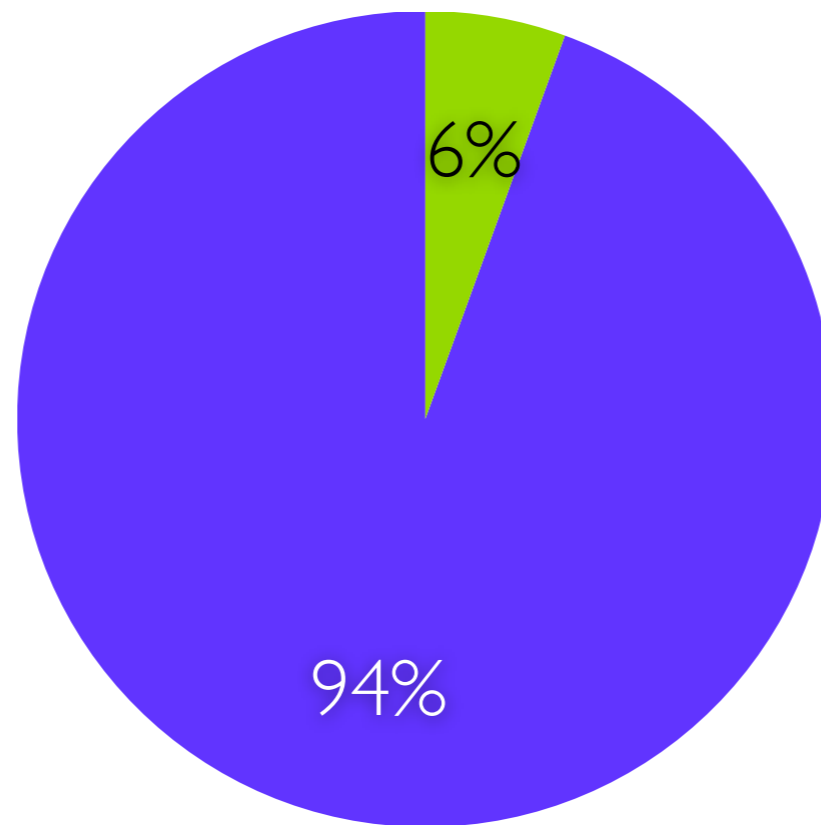
2.3:1

to 16.7:1

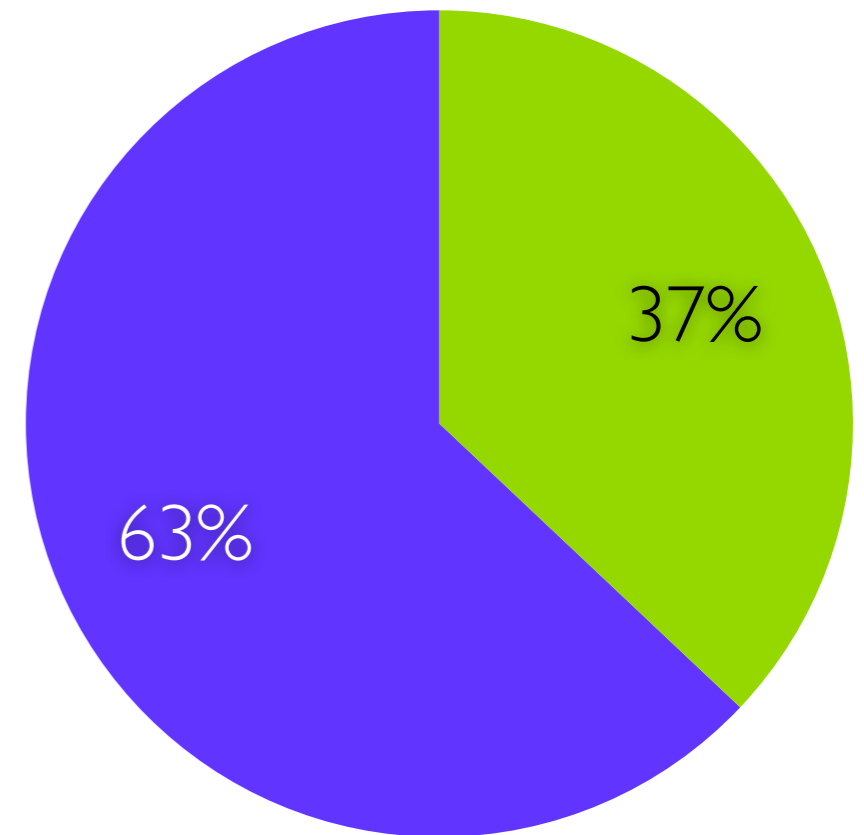
to 1.7:1



1979-1984

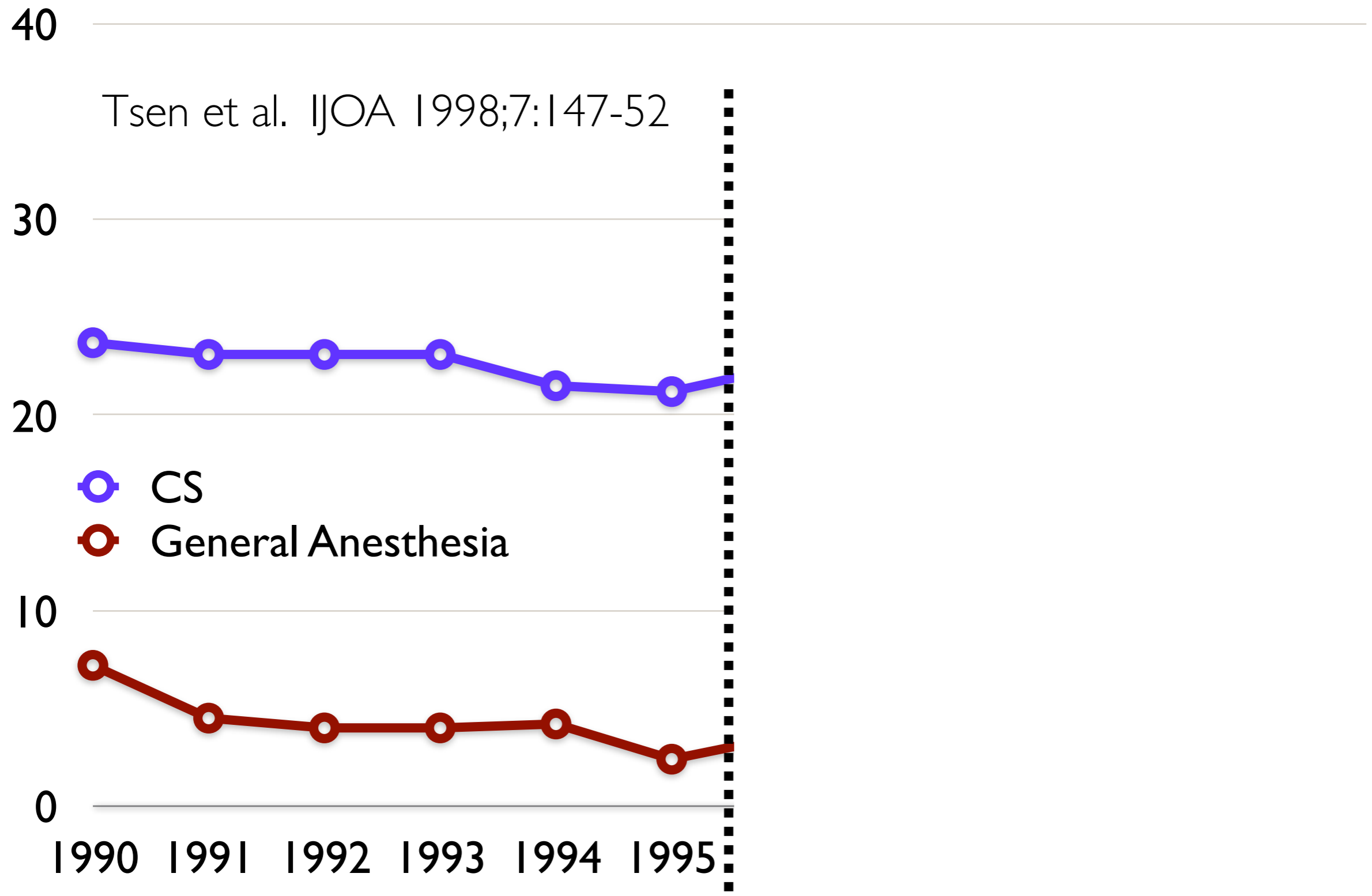


1985-1990

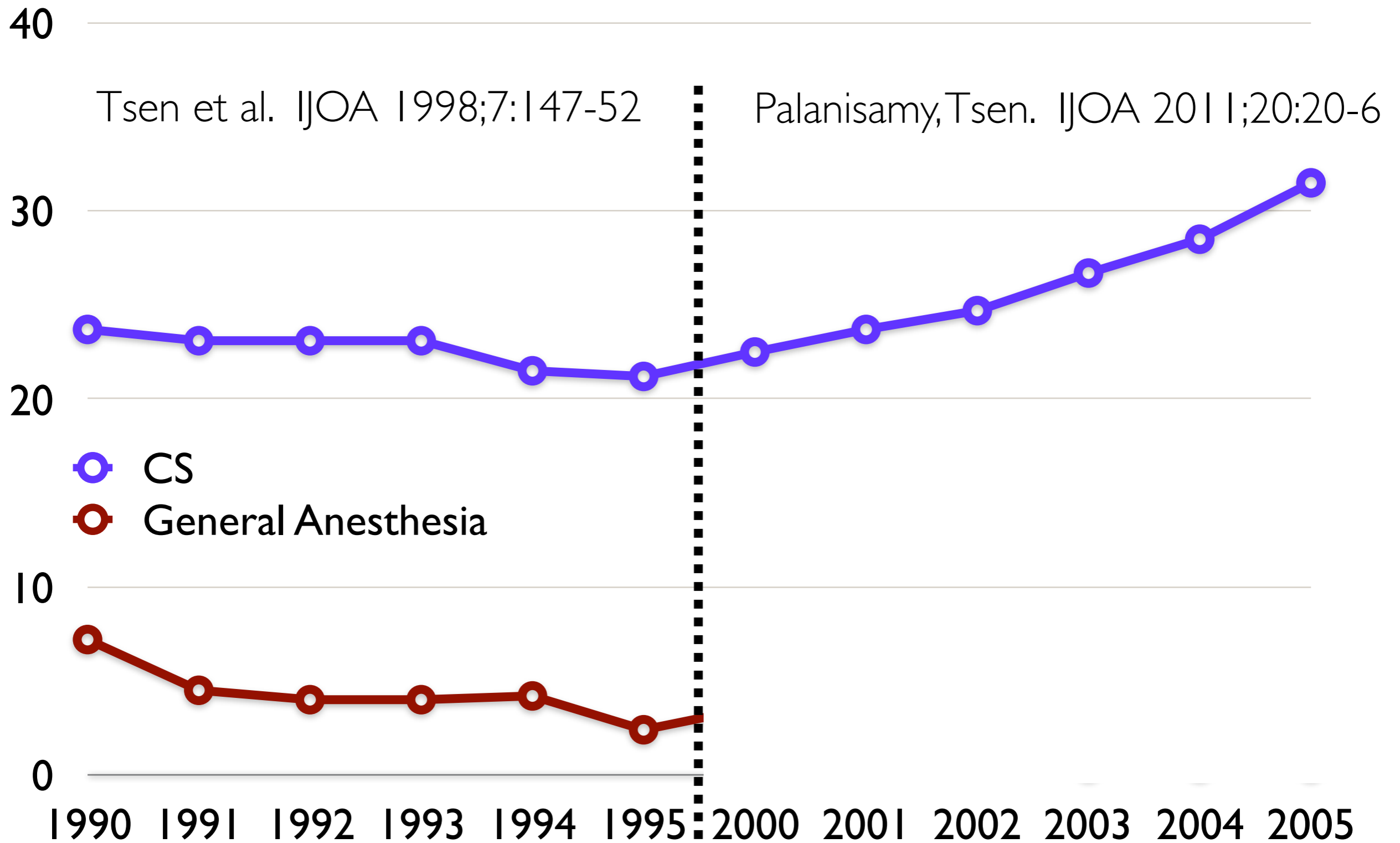


1991-2002

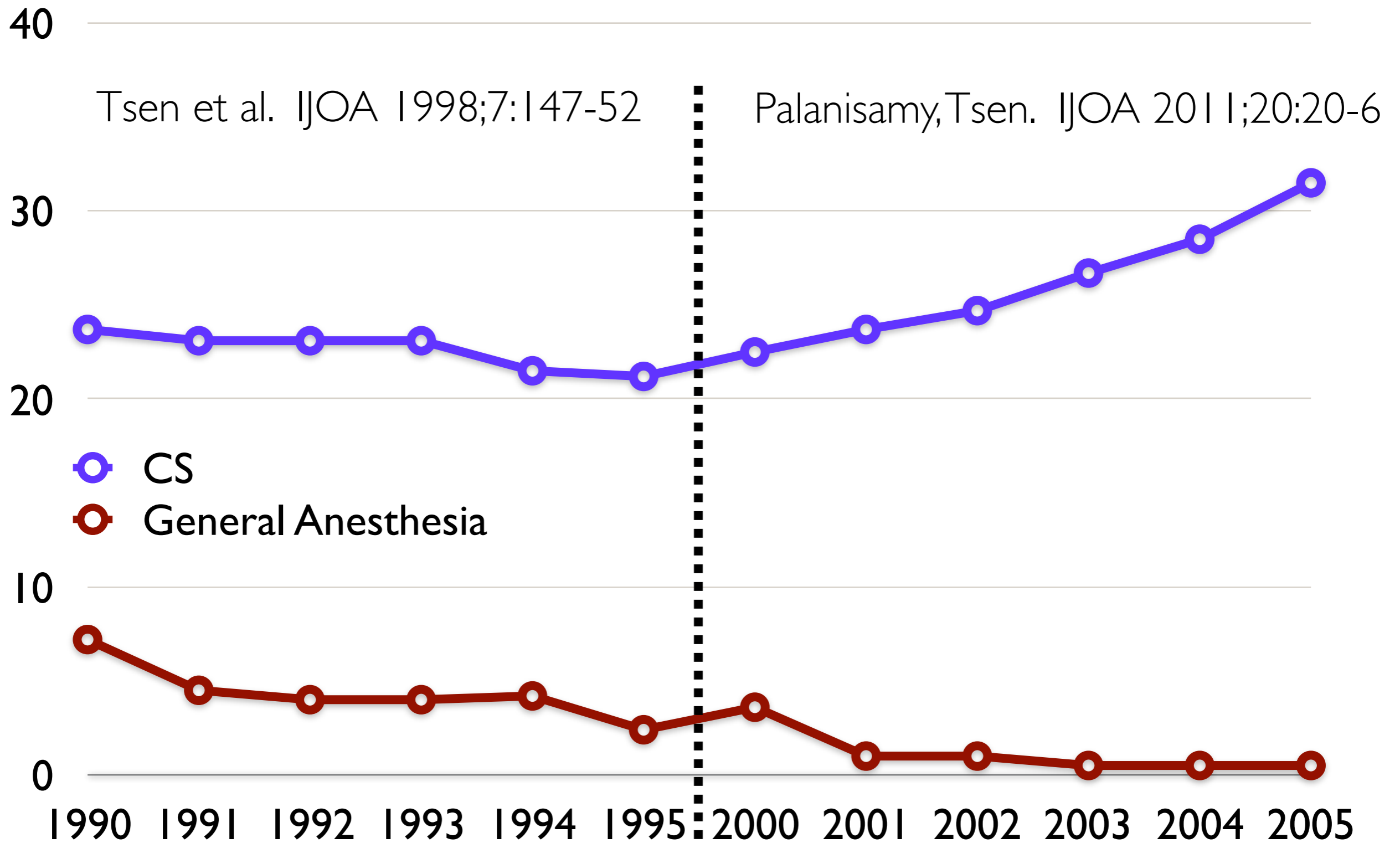
Variation-Cesarean/GA



Innovation-Cesarean/GA



Innovation-Cesarean/GA



Innovation-Neuraxial Commitment

Pre-Op

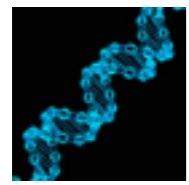
- Instituted a “high risk” parturient consult system

Labor and Delivery

- Mandated *the ability* to see all parturients
- Requested OB’s, Nurses: “early warning system”
- Inserted *prophylactic or early* epidural catheters

Conversion to Cesarean Delivery

- Implemented *fastest* anesthetic (chloro + bicarb)
- Explained *commitment* to neuraxial technique

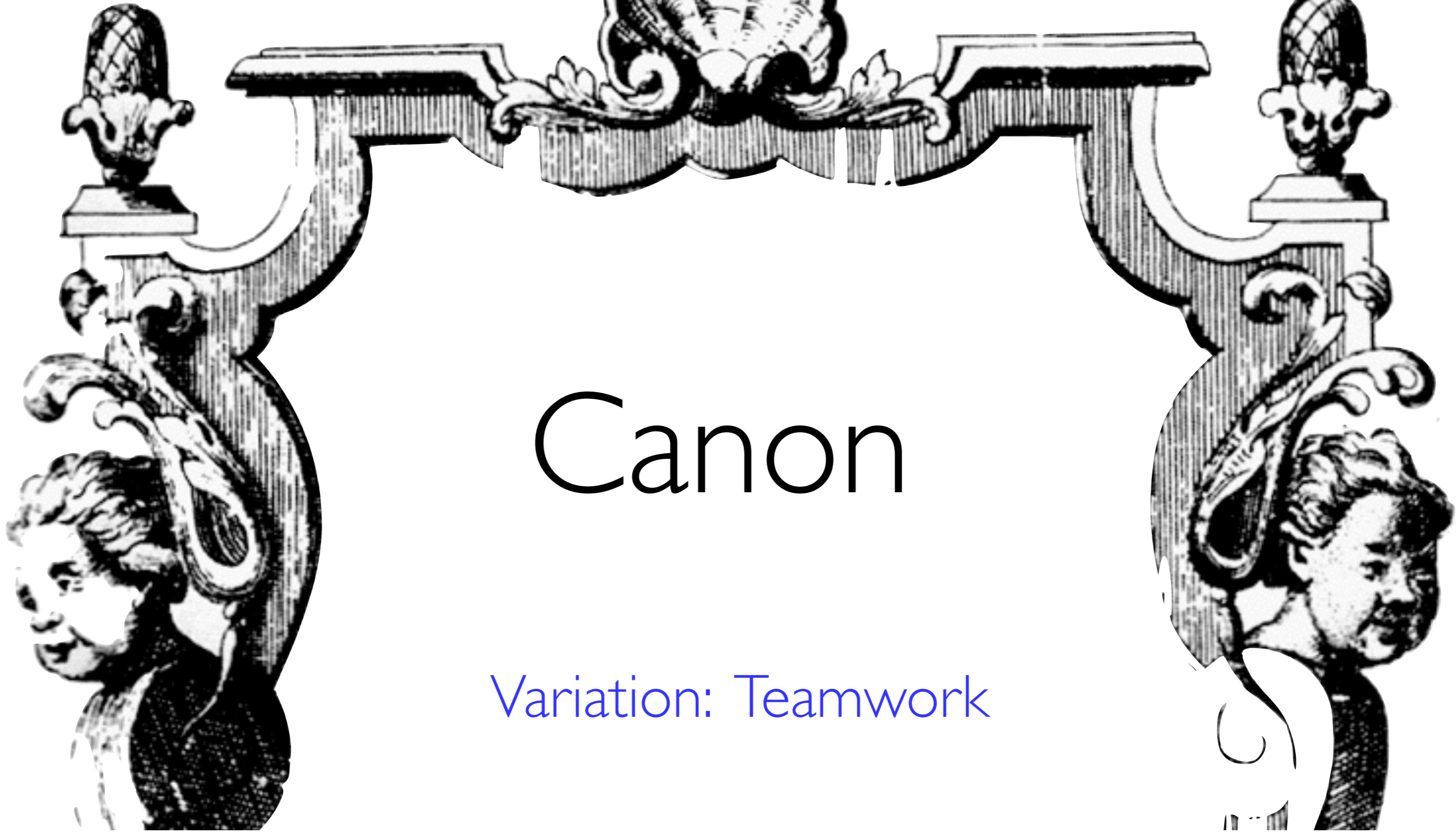


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Canon

Variation: Teamwork

Canon: A counterpoint method that **duplicates**, sometimes **alters**, and then **follows** the melody.



When another voice or part comes in, it's harmonious and orchestrated

Variation-Music



Event

Response

Variation-Medicine

Critical Event

Low Frequency
High Acuity
(145/10,000 cases)

Response

Arriaga AF, et al. NEJM 2013;368:246-53
Talala RS, et al. Acta Anaesth Scand 2011;44:1206-14

Variation-Medicine

Air Embolism
Anaphylaxis
Brady/Tachycardia
Cardiac Arrest
Failed Airway
Fire
Hemorrhage
Hypotension
Hypoxia
Malig Hyperthermia

Response

Arriaga AF, et al. NEJM 2013;368:246-53
Talala RS, et al. Acta Anaesth Scand 2011;44:1206-14

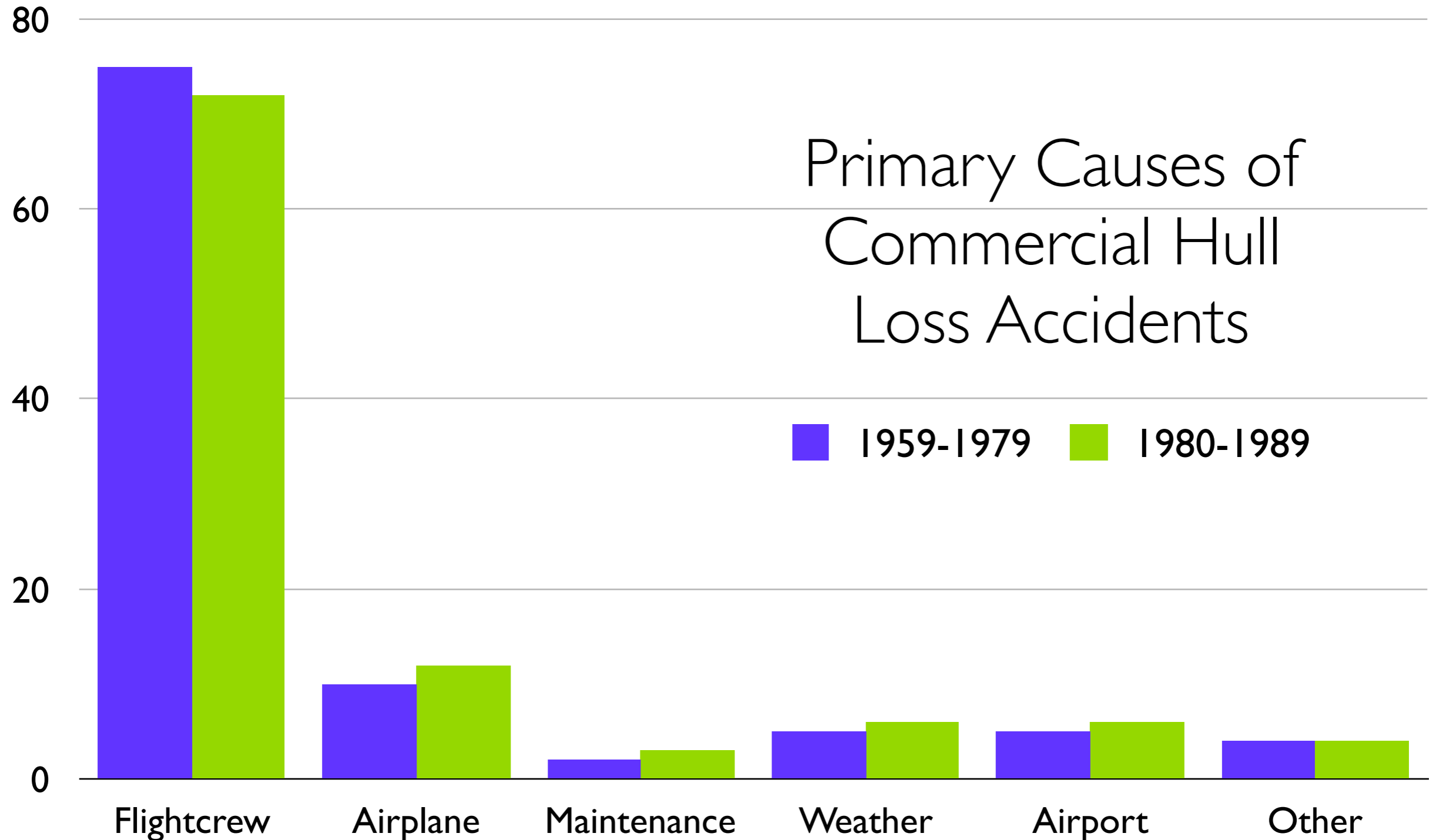
Variation-Medicine

Air Embolism
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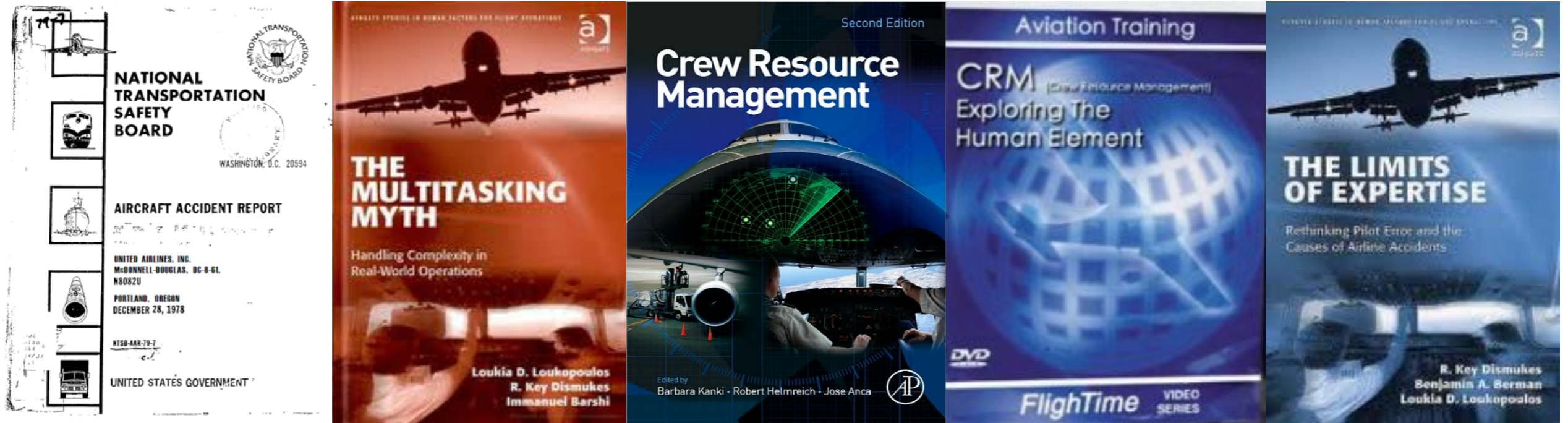
Rapid Team Based
Management

Arriaga AF, et al. NEJM 2013;368:246-53
Talala RS, et al. Acta Anaesth Scand 2011;44:1206-14

Variation-Aviation



Innovation-Aviation



Cockpit/Crew Resource Management:
The process of training crews to **reduce error** by
making better use of **human resources**

Communication, Decision Making, Checklists

Innovation-Checklist

Air Embolism

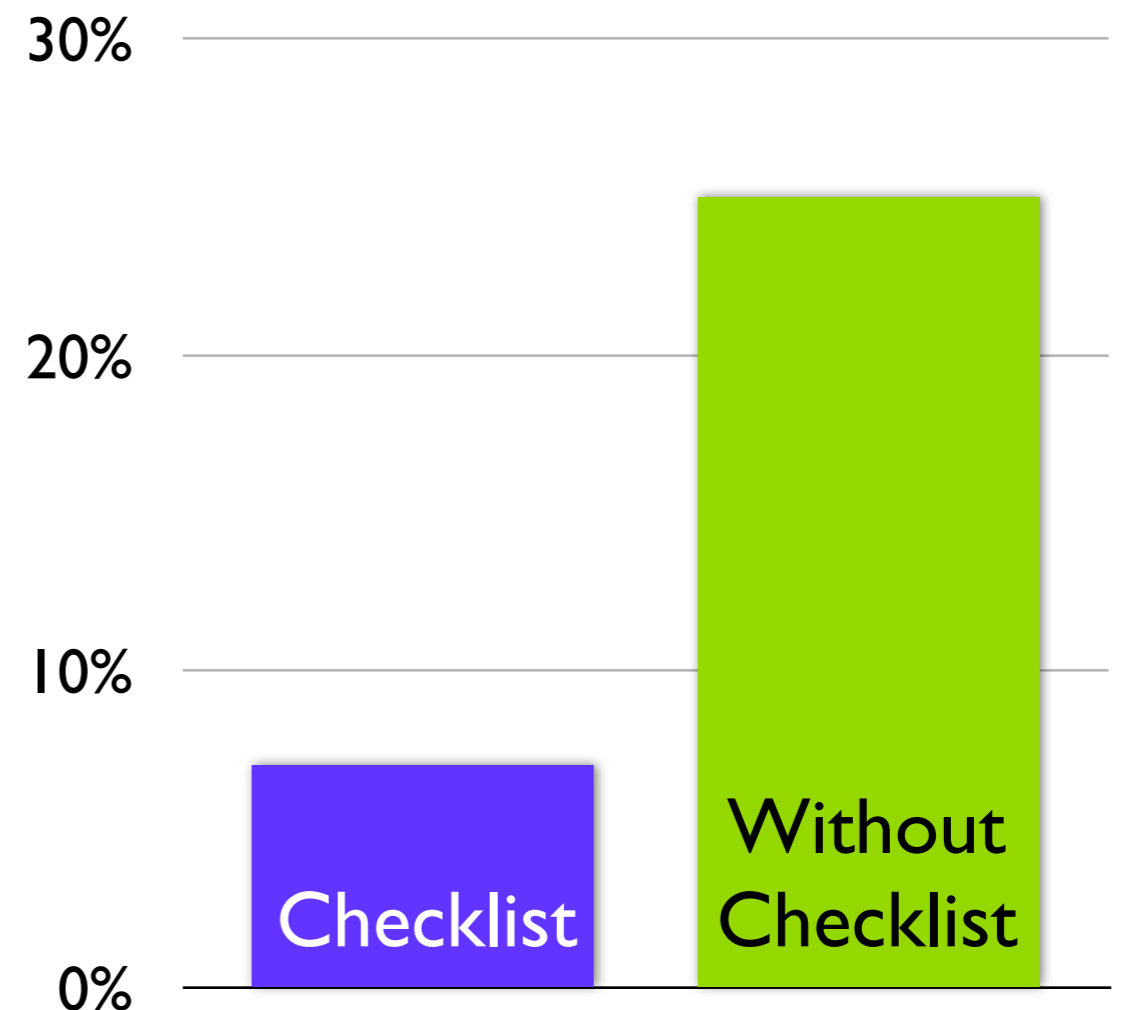
- Call for help
 - Increase FiO₂ to 100%
 - Stop Nitrous Oxide
 - Stop Source of Air Entry
 - Call for Transesophageal Echo (if available)
 - Consider left side down, air aspiration (central line), vasopressors (dobutamine, norepi), chest compressions (100/min; to force air through lock, even if not in cardiac arrest).
- Condition: Suspected Air Embolism (decreased ETCO₂ and oxygen saturation)
 - Objective: Restore normal oxygen saturation and hemodynamic stability, and stop source of air entry

Innovation-Checklist

17 Operating Room Teams

- Each team had 6-8 scenarios
Checklists for 50%
- Checklist use reduced missed critical steps by 75%
- Every team performed better
- Checklist use desired by 97%

Critical Steps Missed



PEA/ASYSTOLE

LARRY F. CHU, MD, MS AND KYLE HARRISON, MD

Continued on Next Page



BEGIN CPR

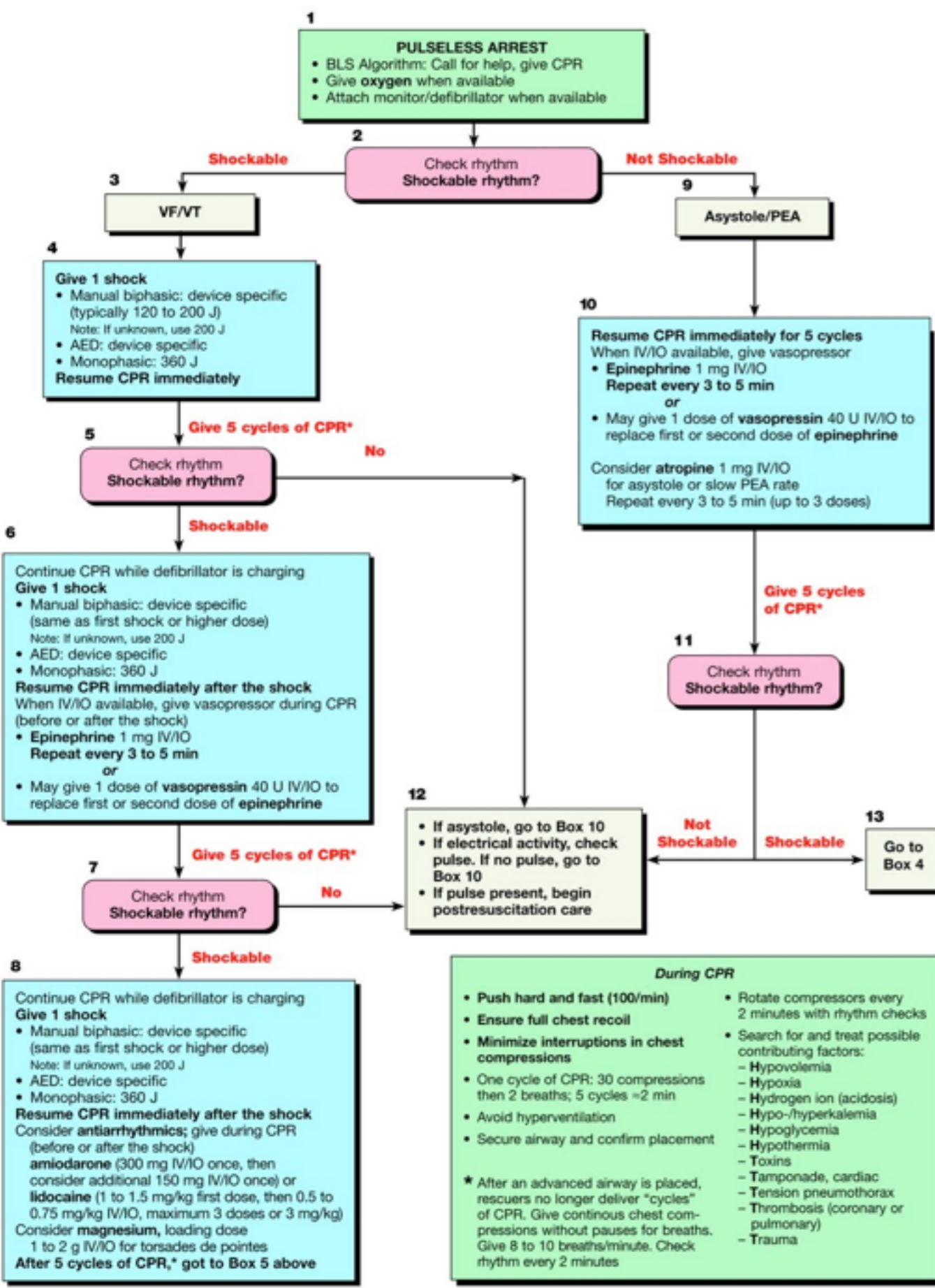
<p>WHO'S THE LEADER?</p> <p>IDENTIFY THE TEAM LEADER</p>	<p>≥ 100</p> <p>≥ 100 COMPRESSIONS/MIN</p>	<p>≥ 2"</p> <p>≥ 2 INCHES DEEP</p>	<p>ALLOW COMPLETE CHEST RECOIL</p>
<p>MINIMIZE BREAKS IN CPR</p>	<p>ROTATE COMPRESSORS Q2 MIN</p>	<p>IMPROVE CPR IF END-TIDAL CO2 < 10 OR DIASTOLIC BP < 20</p>	<p>THEN... IMPROVE CPR!</p>

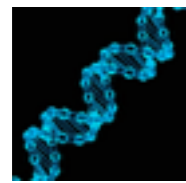
1. CALL FOR HELP
2. CALL FOR CODE CART
3. INFORM THE TEAM

IMMEDIATE

ALWAYS ASSESS AND PERFORM AS NEEDED

<p>ADEQUATE?</p> <p>AIRWAY & VENTILATION?</p>	<p>IV LINE</p> <p>ADEQUATE IV ACCESS? IF NOT →</p>	<p>IO LINE</p> <p>CONSIDER INTRASKELETAL LINE</p>	<p>VT/VE?</p> <p>DETECT & TREAT VT/VF</p>
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Harpsichord

Variation: Environment



Harpsichord



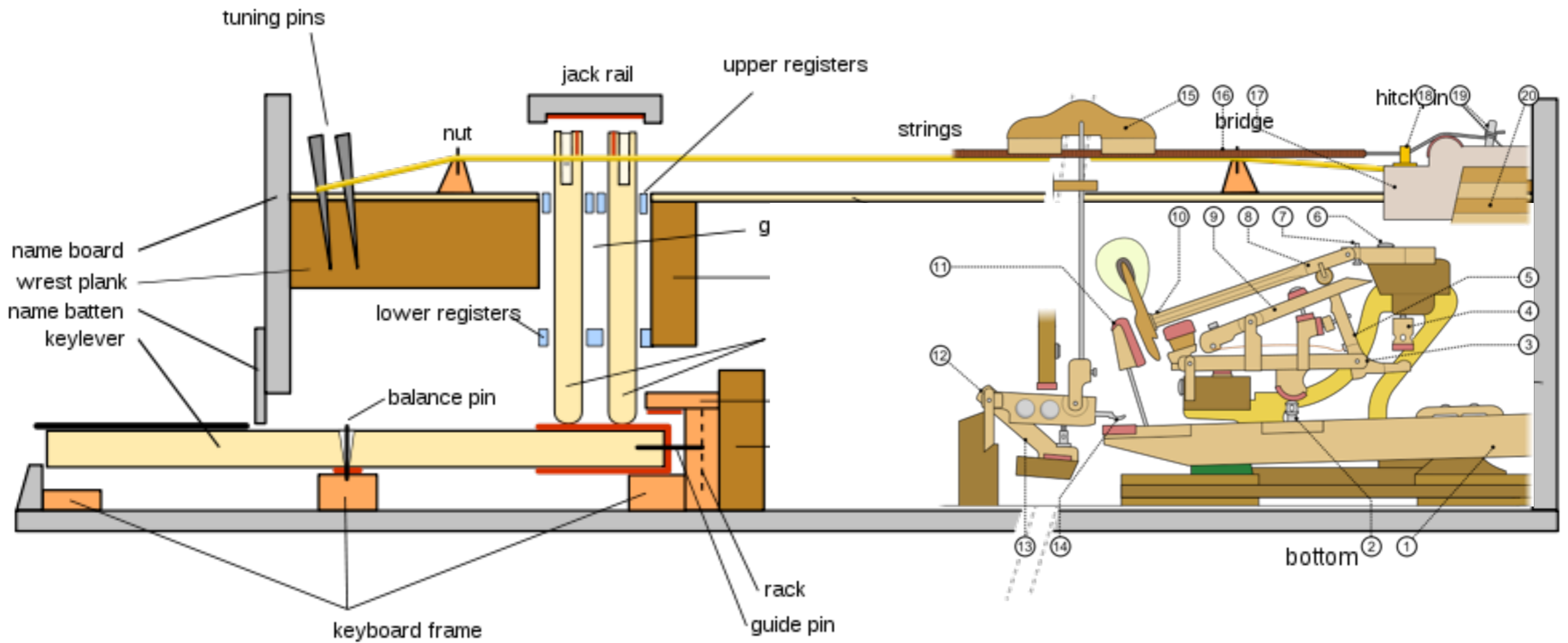
- 2 Keyboards
- Greater Key Resistance
- Smaller Key Dip
- Slimmer Keys/Short Distance
- White/Black Key “reversed”
- No dynamics (harder does not result in louder)
- Each note played individually

Variation



Hubbard "Three Centuries of Harpsichord Making" Harvard University Press, 1965

Innovation-Piano



Variation-Disruption

What is
Disruptive
Conduct?

- Conduct that **intimidates** others to the extent that quality and safety are compromised.
Joint Commission
Sentinel Alert 40, 2008
- Conduct that diminishes or destroys **relational trust**
BWH
- Conduct that adversely impacts **ability for best work**

Variation-Disruption

Disruptive Behaviors

- Using profane or disrespectful language
- Yelling, berating or insulting others
- Throwing instruments, charts, or other objects
- Bullying, demeaning, or intimidating conversations
- Criticizing other providers in front of patients or other staff
- Making sexual comments or innuendo
- Using insidious intimidation, including sarcasm, nonverbal gestures, or passive-aggressive behavior

Variation-Disruption

Disruptive Behavior Frequency

ISMP Medication Safety (2004)

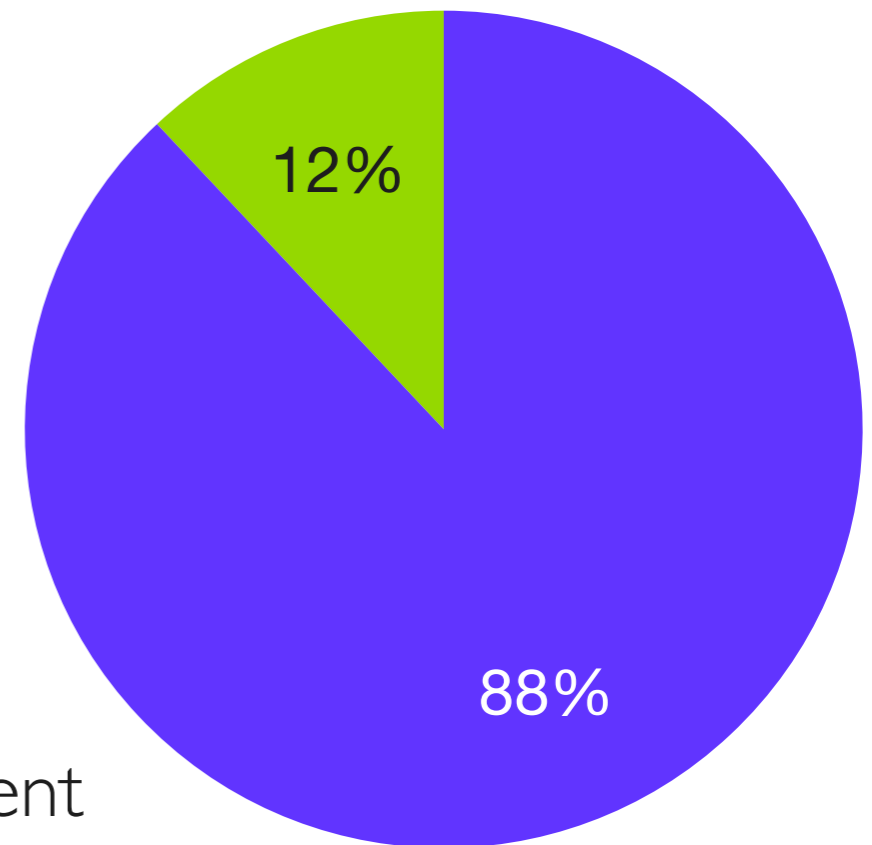
- 48% reported strong **verbal** abuse
- 4% experienced **physical** abuse

1200 physicians, 500 nurses, 50 hospitals (2011)

- 42% medical students **experienced** harassment
- 86% nurses **witnessed** disruptive behavior
- 90% residents **reported** sexual harassment

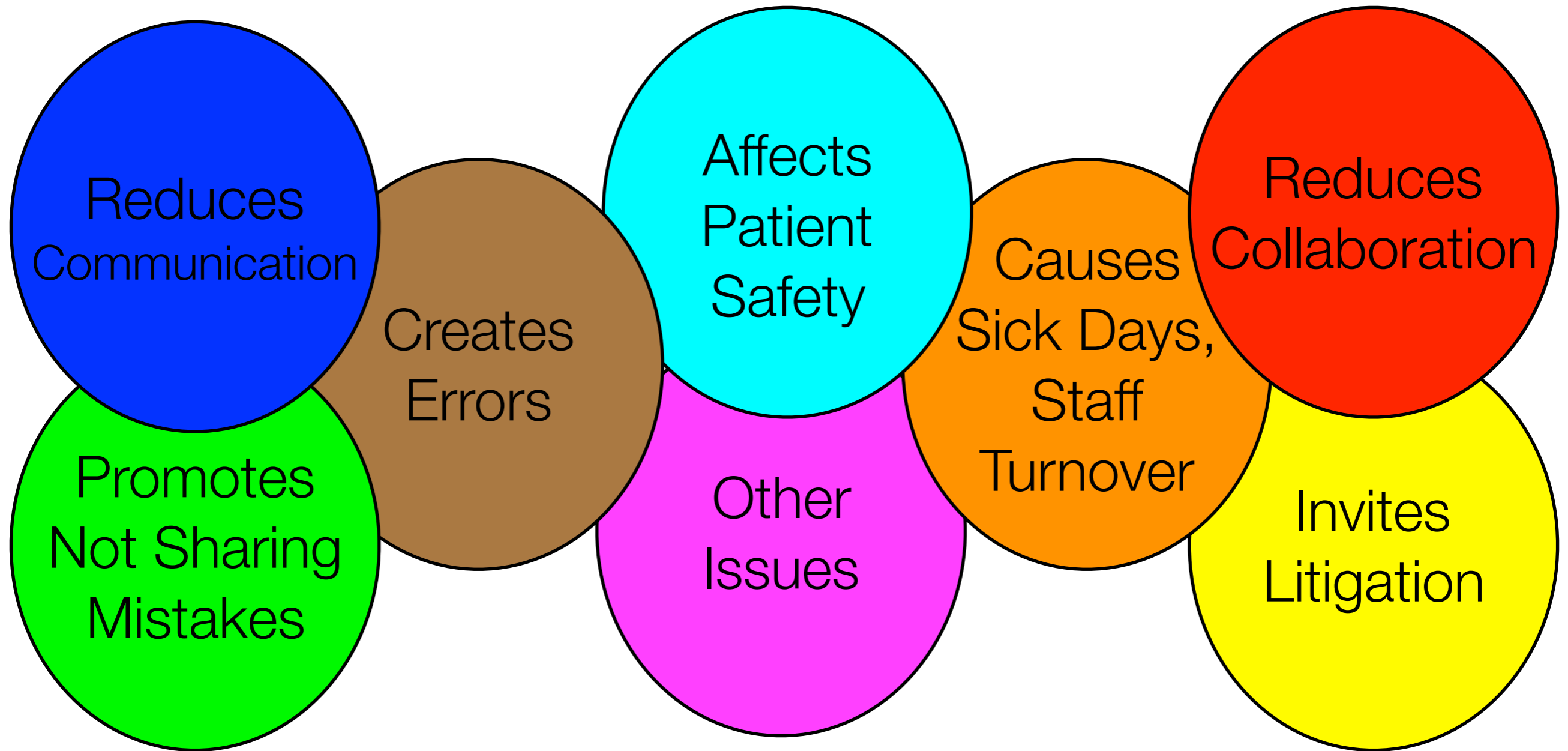
Operating Room Study (2012)

- Average of 1-4 conflicts/operation



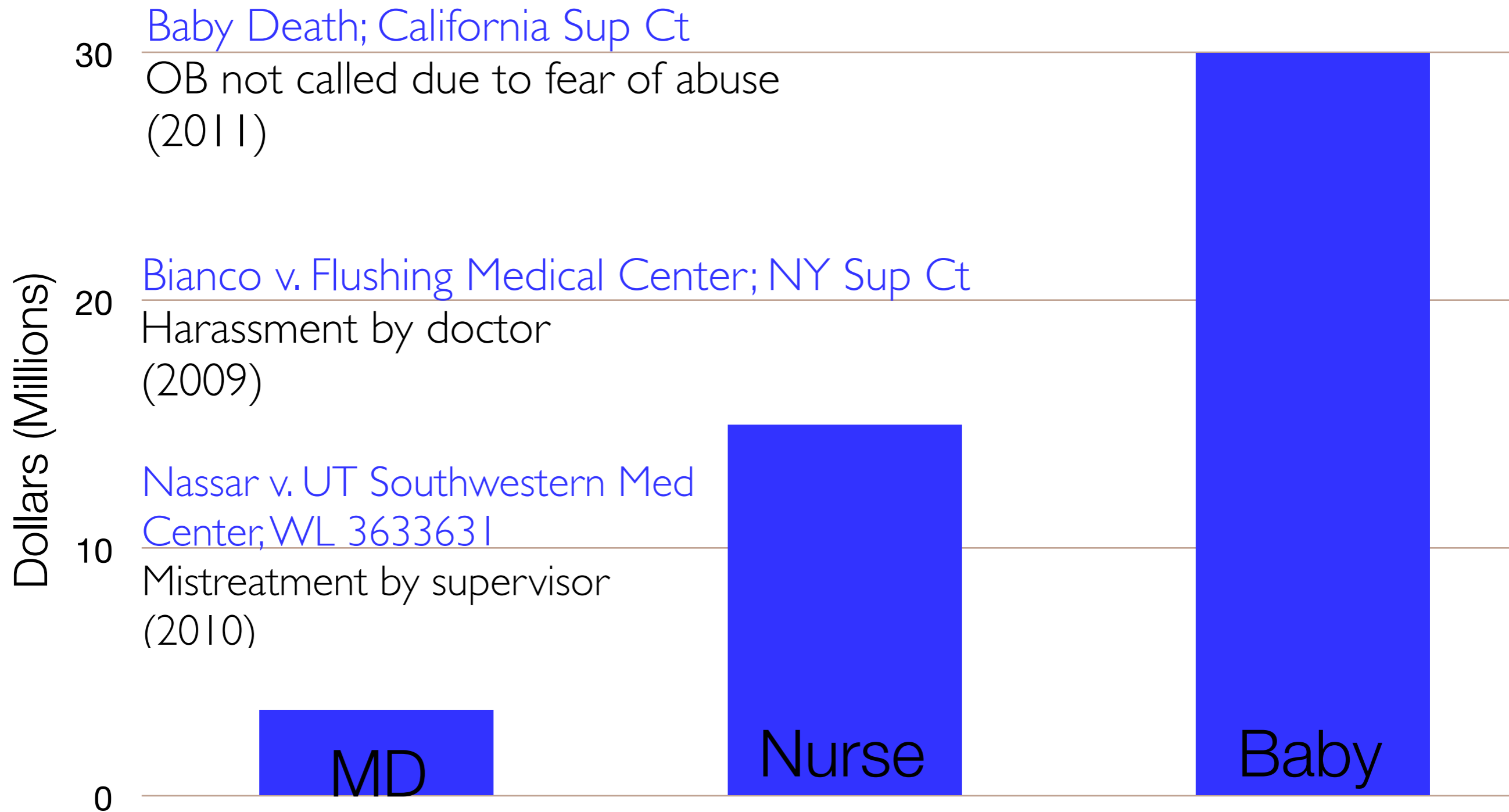
● Experienced
● Not Experienced

Variation-Disruption

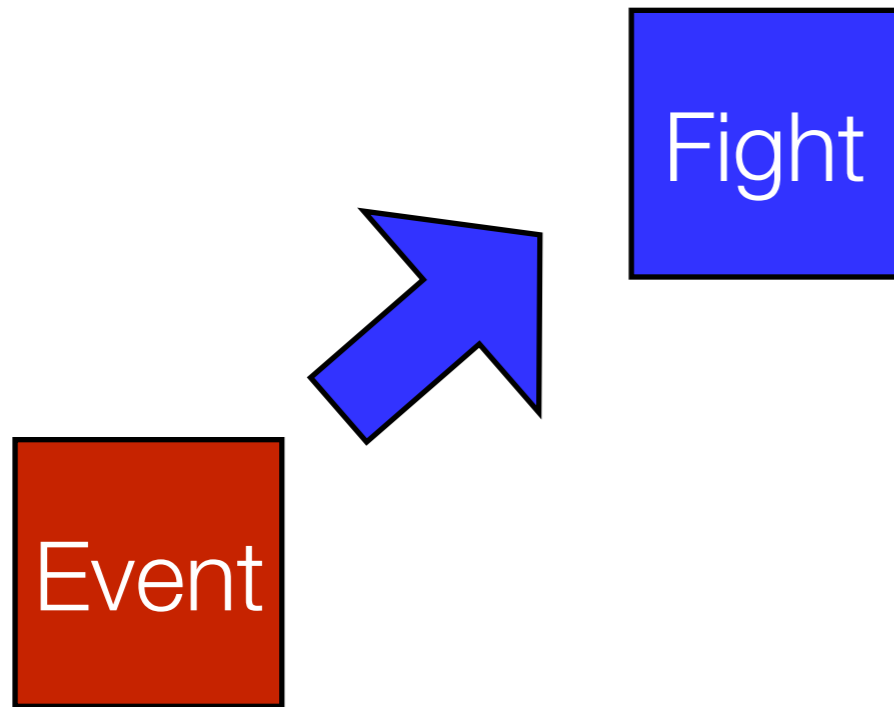


Rosenstein A, Jt Comm J Qual Patient Saf 2008; Simpson K, Jt Comm J Qual Patient Saf 2009; Hickson G, Clin Obstet Gynecol 2008; Clark S, Obstet Gynecol 2008

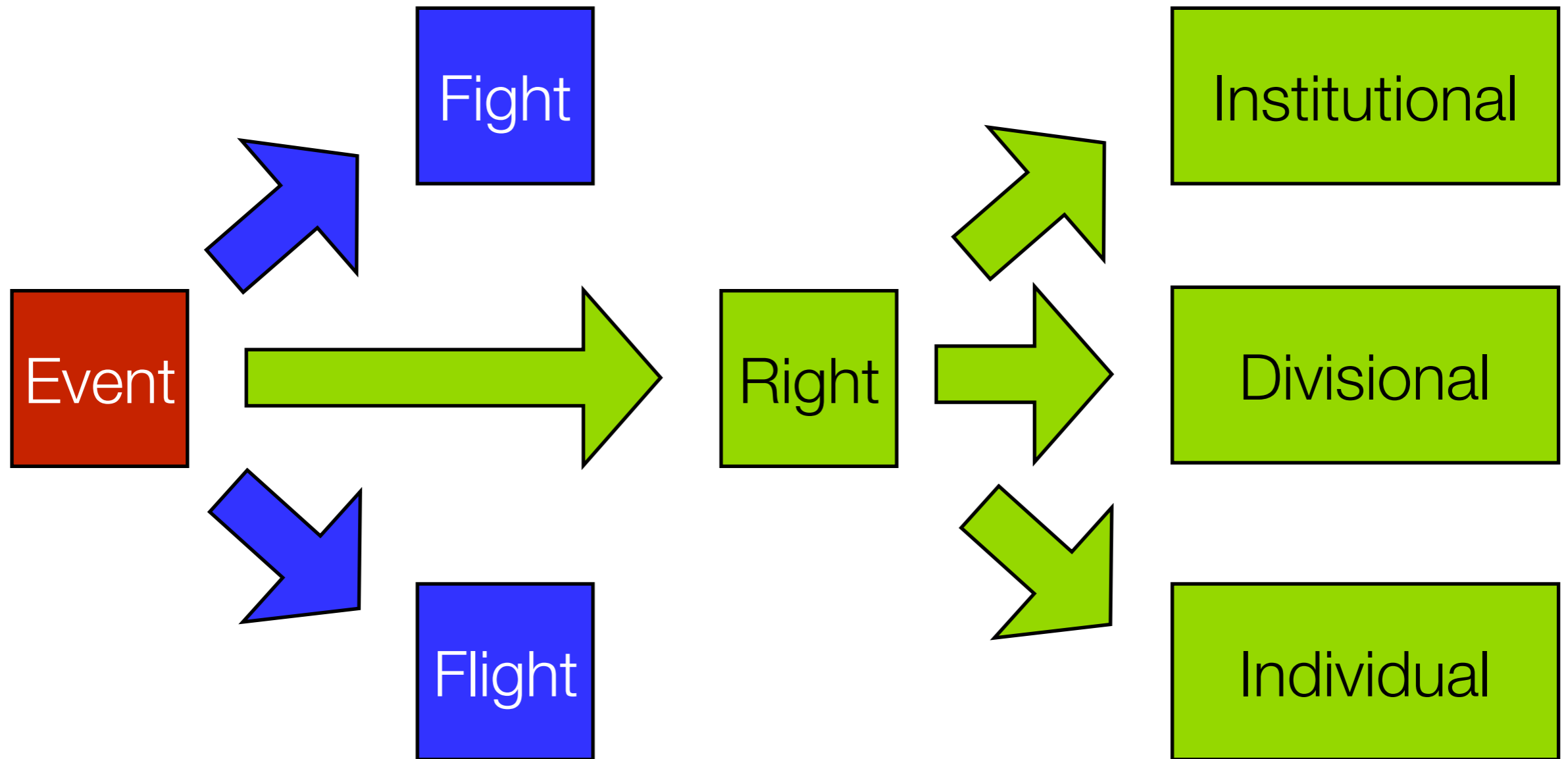
Variation-Disruption



Variation-Response



Variation-Response



Innovation-Response

President/CMO

Ombudsman

Human
Resources

Physician's Org

Code of Conduct

Employee
Assistance

Legal Counsel

Reporting System

Center for
Wellness

Investigating

Monitoring

Educating

Center for
Professionalism
& Peer Support

Institutional Response

Take Action

- Immediate Suspension
- 360 Interview

Meet Individual + Authority Figure

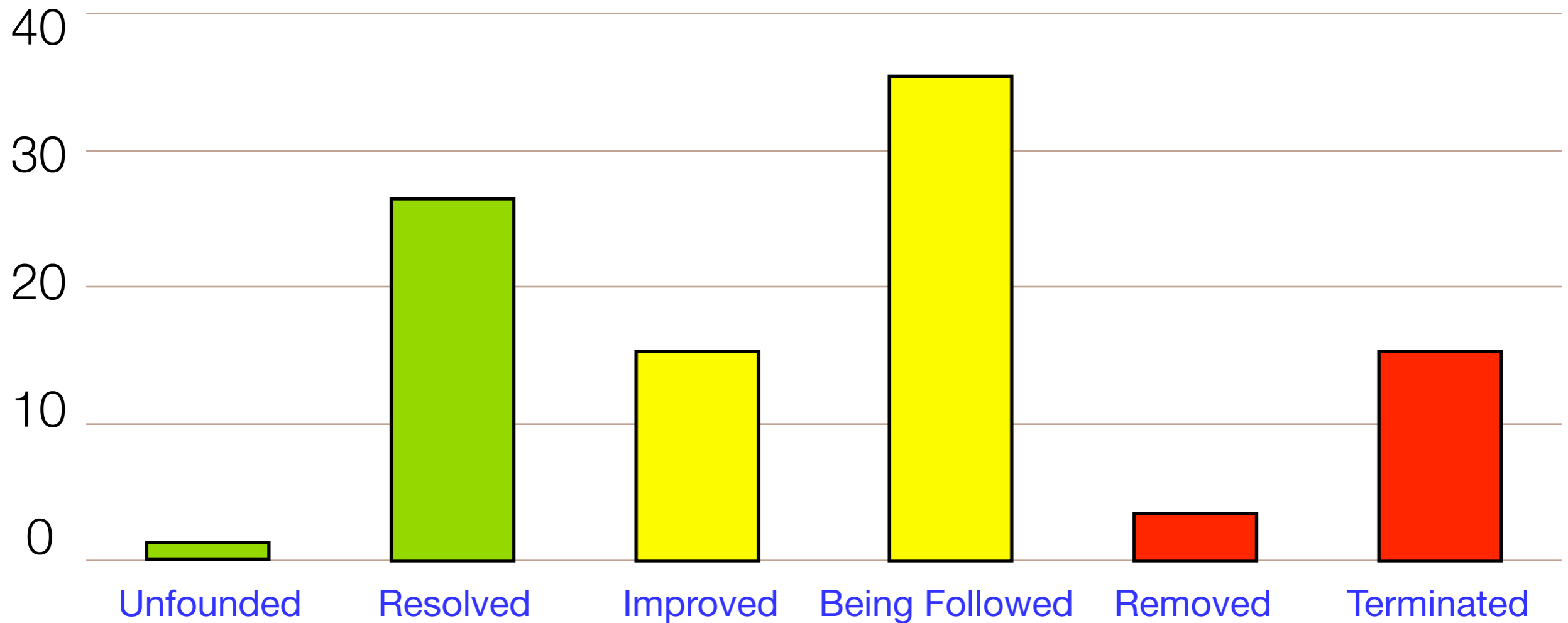
- Communicate/Contract Expectations
- Provide Assistance (Counseling/Change/Support)
- Non-Retaliation Policy

Measure Performance/Give Feedback/Consider Actions

Deep Seated	Situational
Age/ Generation	Medical Training
Sex	Recent Life Experiences
Culture/ Ethnicity	Environmental Pressures
Upbringing/ Life	Provoked Response
Personality	

Institutional

Unprofessional Behavior Reports (2009-12): n = 170



Divisional or Departmental Response

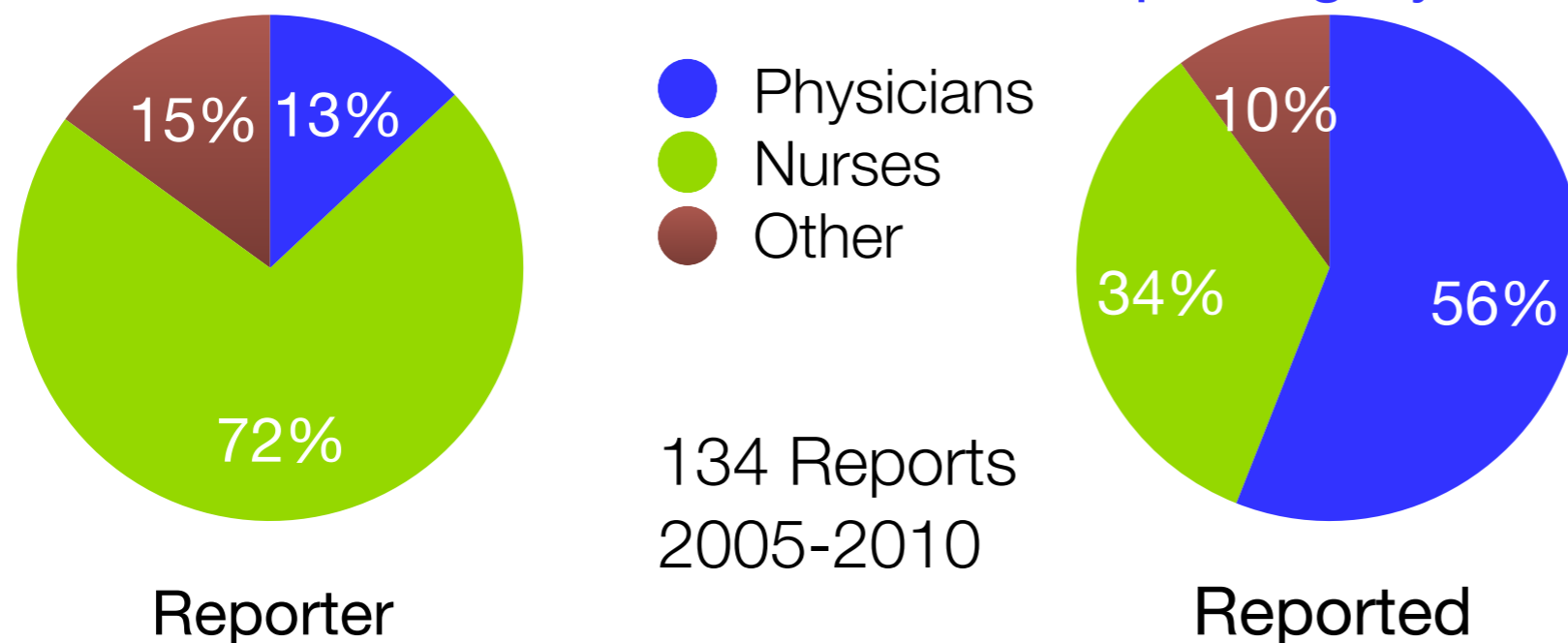
Mount Sinai Medical Center: 1,171 bed, tertiary center, with 6000 deliveries

OB service: 125 physicians, 160 nurses, 50 support staff, 10 midwives

Goal: Improve safety culture by implementing Code of Professionalism

- Q: What gets in the way of you providing excellent, safe care every hour of every shift, of every day?
- A: Verbal abuse, Not Answering Pages, Rudeness

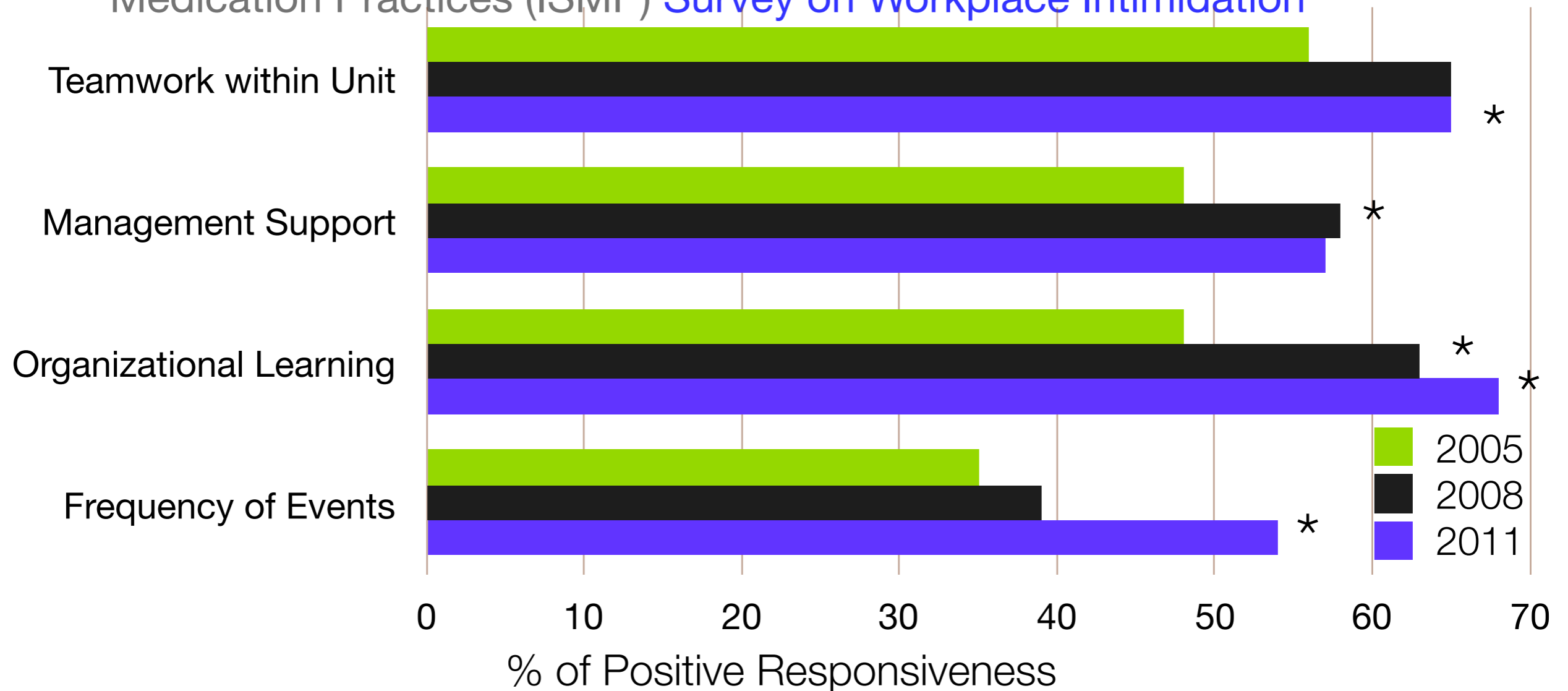
Instituted “Code of Professionalism” Reporting System



DuPree et al.
Jt Comm J Qual
Patient Saf
2011;37:447-55

Divisional or Departmental Response

- **Mount Sinai Medical Center:** 1,171 bed, tertiary center, with 6000 deliveries
- US Agency for Healthcare Research and Quality (AHRQ) + Institute of Safe Medication Practices (ISMP) [Survey on Workplace Intimidation](#)



Individual Response

Be Mindful

Words, Actions,
Timing, Place

Model Behavior

Stay in the “Present”

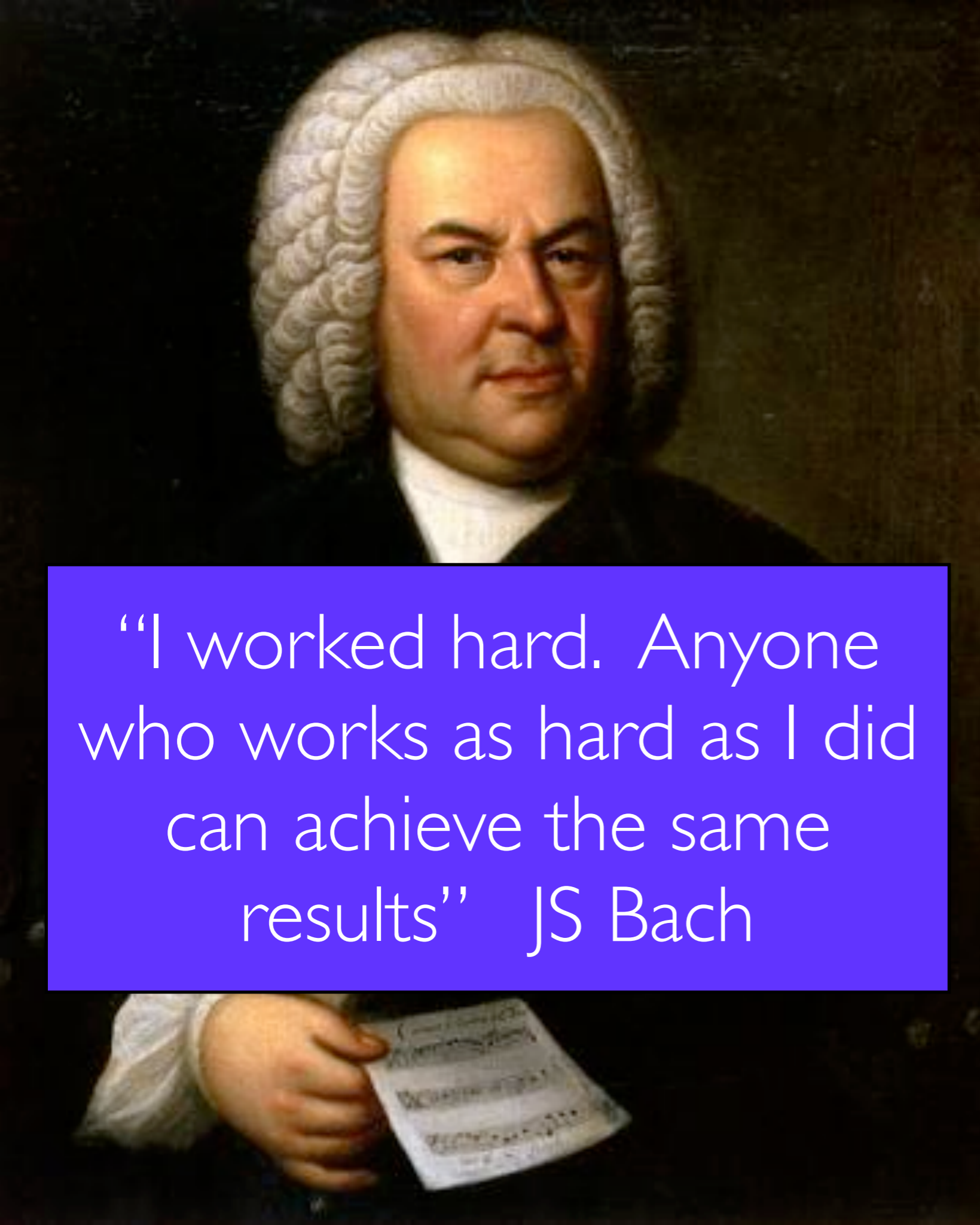
Focus on Behavior

Your Experience

Document & Report

One of the most powerful tools to enable us to close the gap between the family we want and the family we get... is **culture**.

Clayton Christensen
How will you measure
your life?



“I worked hard. Anyone who works as hard as I did can achieve the same results” JS Bach

Bass line

V: Interdiscipline
I: Huddle

Aria

V: Nature
I: Avoid Airway

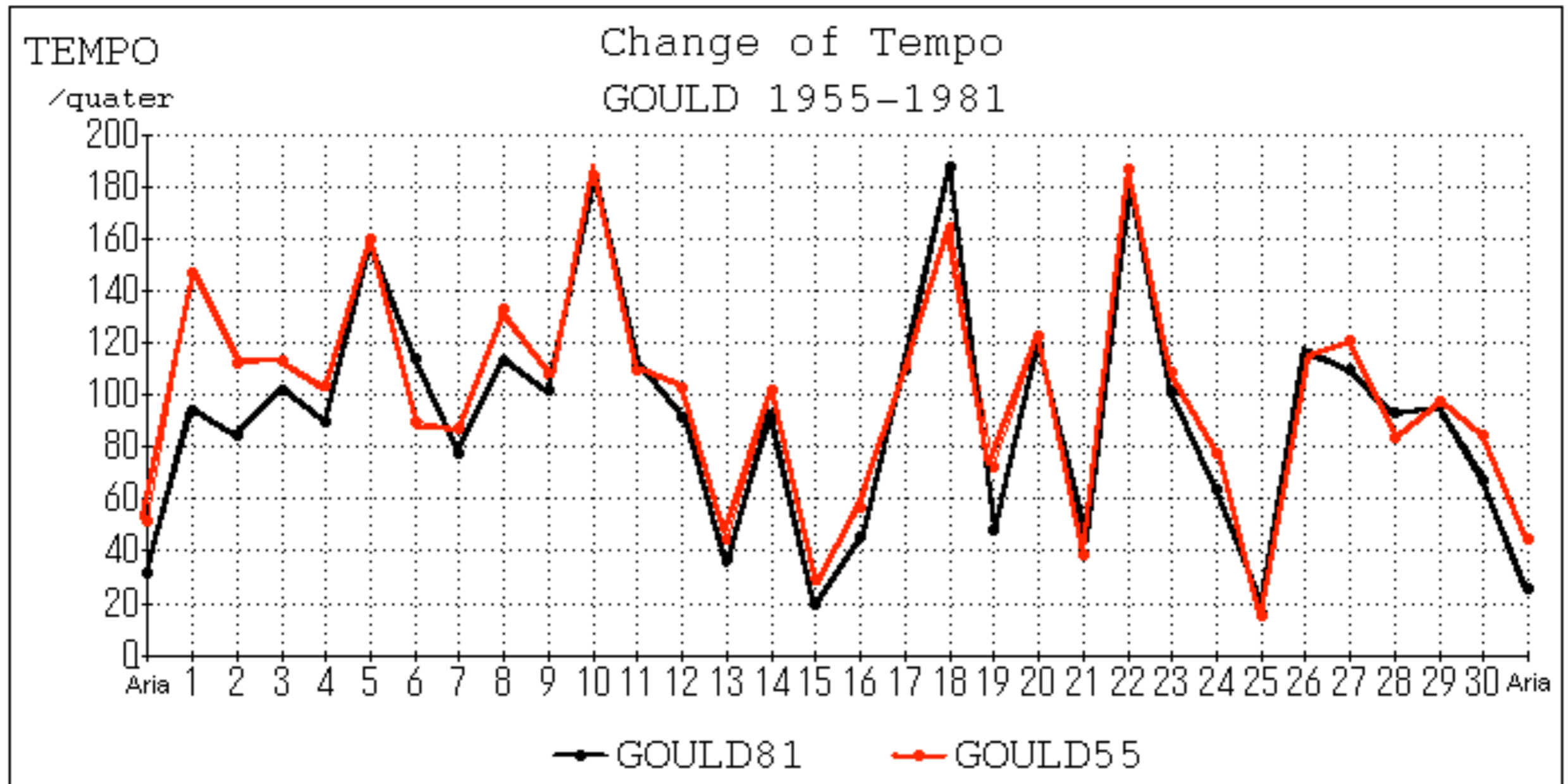
Canon

V: Teamwork
I: Checklists

Harpsichord

V: Environment
I: Culture

Variation-Goldberg





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Questions

