PERFECT STORM PART II: IS A TSUNAMI BREWING?

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Conflict of Interest & Why am I qualified to do this?

- I have no conflicts except:

(1) I have a long standing interest in the economics of academic anesthesia practice dating back to collaborations which began with Amr Abouleish and others in the late 1990's.

(2) We continue to perform collaborative research utilizing national databases.

Perfect Storm Overview: Part I

This has been presented from 2000-2011 by Kevin Tremper and leaves a wonderful legacy for us in Academic Anesthesiology.

No data was presented in 2012 at the SAAA Meeting. I have presented 2012 data for completeness in some of the slides. I have compiled this data since 2013.

The Etiology of Perfect Storm Part I

MATCH DAY 1994

Wall Street Journal March 17, 1995 – *G. Anders* "Once a hot specialty, Anesthesiology cools as insurers scale back"

- 1994 Grads-1,863 Residents graduate from Anesthesia Residencies
- 1995 Start – 892 Residents, consisting of 348 IMG's and 544 AMG's
- "This was the start of the lost generation." The specialty is now feeling this loss at another level, as individuals from this "lost generation" should be morphing into significant leadership positions.

Size of Residency Training Programs

- In 2017- 1,630 Senior Residents. A total of 6,207 Anesthesiology Residents are enrolled in 150 Core Residency Programs graduated (**35% women enrolled in all training programs**).

Residency Production: Confounding Factors

- In 2017, we know that the following pursued ACGME fellowships:

Number of Programs (N)	Positions Filled	% Women
Critical Care Medicine (N=53)	150/202	28%
Pain Medicine (N=98)	331/335	22%
Pediatrics (N=55)	184/213	48%
Adult Cardiothoracic (N=64)	202/207	30%
OB (N=27)	38	59%
Clinical Informatics (N=0)	0	N/A

SAAA YEARLY SURVEY DATA 2017

2017 Average Department

	Mean	+/- SD	Median
Surgical Anesthesiologist FTE s	49.6	32	42.2
Acute Pain (In-Patient)	2.3	2.58	1.2
Chronic Pain (Out-Patient)	3.7	2.9	3.0
ICU	4.0	4.8	2.0

2017 Average Department Academic Rank

Chair	1.0
Professor	8.6
Associate Professor	13.9
Assistant Professor	38
Instructor	6.3
Non Academic Clinical	3.1
Total	70.9

National Clinical Coverage

	Mean	+/- SD	Median
How many OR s does your Department cover each day Monday- Friday?	46.6	27	42
How many Non-OR/Off Site locations does your Department cover each day Monday-Friday?	13	9.89	10
How many OB deliveries with anesthesia involvement does your Department have each year? *How do we staff OB at night and at what level of deliveries does it take to have a dedicated person covering this service?	3,038	2,248	2,424

National Clinical Coverage

	Mean	+/- SD	Median
How many faculty do you have on each of these services per day on average, Monday thru Friday in the daytime.			
OR	29.8	19.9	24
OB	1.5	1.03	1
ICU	2.0	2.09	1.8
Acute Pain	1.4	1.05	1
Pain Clinic	2.7	1.92	2
Pre-Op Clinic	1.0	0.76	1
Other	1.3	2.71	0
Total	39.7		

Average Department Clinical Sites Coverage Monday-Friday

	Mean	+/- SD	Median
ORs	46.6	27	42
Off Site	13	9.89	10
OB	1.5	1.03	1
ICU	2.0	2.09	1.8
APS	1.4	1.05	1
Pain	2.7	1.92	2.0
Pre-Op	1.0	0.76	1
Other	1.3	2.71	0
Total	69.5		
Faculty/Sites	***70.9/69.5= 1.02**	**(0.7953 in 2016)**	

* Reflection of total faculty not clinical FTE

National Institutional Support

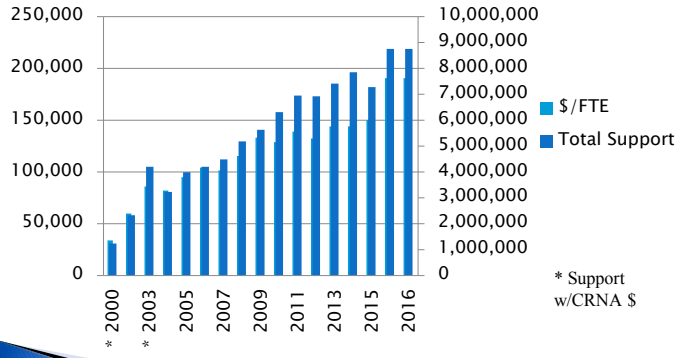
	Mean	+/- SD
Institutional Support	$ 11,063,270	$ 8,426,667
Institutional Support / FTE	$ 183,712	$ 130,961

Total Support	25%	Median	75%
Total Support	$ 4,252,814	$ 8,924,693	$ 16,665,818
Total Support per FTE	$ 74,872	$ 167,473	$ 258,494

Mean National Institutional Support

Total Support/FTE	**2017**	**$ 183,712**
	2016	**$ 190,584**
	2015	**$ 191,912**
	2014	**$ 196,441**
	2013	**$ 181,000**

Total National Department Support (Without CRNA Support)



Comparison of Economic Status by Departmental Size

<40 (n=23) **+88 (n=24)**

<40 n= 23	Mean	+/- SD	Median
Institutional Support	$ 3,921,534	$ 3,643,429	$ 2,200,000
Institutional Support per FTE	$ 152,573	$ 142,234	$ 118,919

+88 n= 24	Mean	+/- SD	Median
Institutional Support	$ 14,947,231	$ 9,861,137	$ 11,958,610
Institutional Support per FTE	$ 135,214	$ 90,809	$ 111,951

National Department Clinical Revenue

	Mean	+/- SD
ASA Units	$ 36,301,401	$ 25,157,497
ICU Units	$ 1,888,944	$ 2,445, 233
Pain Units	$ 2,692,156	$ 3,452,932
Other	$ 1,020,986	$ 1,290,986
Total	**$ 41,903,487**	

National Collection / FTE

	Mean	+/- SD
ASA Units	$ 588,325	$ 410,649
ICU Units	$ 24,442	$ 26,179
Pain Units	$ 49,375	$ 103,634
Other	$ 12,924	$ 14,724

Is it a true reflection of clinical FTE??

Billing Production National	Mean	+/- SD
Total Anesthesia Units Billed	768,234	369,337
Total Anesthesia Units Billed Per FTE	12,317	36,666

Billing Data	Mean	+/- SD
What is your gross unit value?	$121.00	$ 37.60
What is your average $ amount collected per unit?	$ 50.63	$ 37.69
What unit value do you receive from Medicaid?	$ 16.40	$ 5.84

Number of Units Billed: Mean Summary	
ASA Units	768, 234
ICU Work Units	26, 051
Pain Work Units	26, 038
Other	12, 681

Billing – Collection Mean Summary	
ASA (Base and Time) units billed for anesthesia service	$ 50.63
Work units in ICUs (wRVUs)	$ 67.32
Units for Pain (wRVUs)	$ 116.39
Any other billed services	$ 57.54

ASA Units – Collections for Anesthesia Services						
n	Mean	SD	90%	75%	50%	25%
89	$50.63	$37.69	$110.00	$52.70	$38.23	$30.00

wRVUs – Collections in ICUs						
n	Mean	SD	90%	75%	50%	25%
75	$67.32	$72.39	$131.16	$69.28	$55.18	$35.00

wRVUs – Collections for Pain						
n	Mean	SD	90%	75%	50%	25%
80	$116.39	$173.08	$159.50	$118.58	$83.81	$57.26

ASA Units Billed: ASA Units/Year						
n	Mean	SD	90%	75%	50%	25%
88	768,234	369,337	1,236,295	1,068,005	664,941	513,399

Units Billed: ICU wRVUs/Year						
n	Mean	SD	90%	75%	50%	25%
74	26,051	26,145	63,920	34,460	18,048	5,299

Pain wRVUs/Year						
n	Mean	SD	90%	75%	50%	25%
81	26,038	21,627	57,511	36,448	19,120	10,898

Number of ASA Units Billed/FTE: ASA Units						
n	Mean	SD	90%	75%	50%	25%
88	12,317	3,666	16,632	14,859	12,513	10,117

SAAA 2017 Compensation
Total Compensation Including Income Plus Pension Contributions

Compensation Includes Income Plus Pension Contribution	25%	Median	75%
Instructor	$ 224,197	$ 303,903	$ 327,950
Assistant Professor	$ 323,000	$ 351,040	$ 384,558
Associate Professor	$ 345,223	$ 386,517	$ 417,093
Professor	$ 368,245	$ 414,703	$ 437,631
Chair	$ 549,642	$ 600,000	$ 665,225

*Is not a reflection of C FTE

Faculty Benefits

	25%	Median	75%
Instructor	$ 0	$ 27,739	$ 53,515
Assistant Professor	$ 48,244	$ 62,115	$ 83,252
Associate Professor	$ 51,214	$ 70,510	$ 89,228
Professor	$ 52,128	$ 70,919	$ 96,002
Chair	$ 61,636	$ 91,432	$ 129,158

Understanding Clinical Productivity for Anesthesiology Departments

Utilize the Following:

- Not Simple
- Key Point: Organizational factors that determine a facility type impact clinical productivity.
- To best understand, compare to similar types of facilities:
  - ASC to ASC
  - Community Hospital to Community Hospital
  - AMC / Trauma to AMC / Trauma

Understanding Anesthesia Clinical Productivity and Survey Results

Utilize the Following:

- Figure from 2003 Paper
- Median Data by Facility Type, 2013 Survey

Clinical Productivity by Facility Type

- 2003 Survey
  Anesth Analg 2003:96:802-12
- 2013 Survey


2013 Survey of Clinical Productivity of Academic Anesthesiology Departments

Association of Academic Anesthesiology Chairs (AAAC) of Society of Academic Anesthesiology Associations (SAAA)

SAAA

AAAC
ASSOCIATION of ACADEMIC ANESTHESIOLOGY CHAIRS


Organizational Factors Affect Comparisons of the Clinical Productivity of Academic Anesthesiology Departments

Benchmarks by Facility Type SAAA 2013

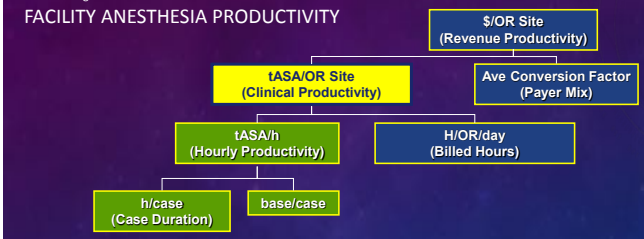
MEDIAN VALUES (50%)	All Groups (n=143)	All non ASC (n=111)	ASC (n=32)	AMC/ Indigent* (n=80)	Children (n=11)	Community (n=20)
Sites						
tASA/OR	tASA = Total ASA units billed, OR = Anesthetizing Site					
H/OR/d	H = 4 time units, d = 250 weekdays/year					
tASA/h	Hourly productivity					
Base/case						
H/case						
Staffing Ratio						

* Includes 1 Heart Hospital

2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, ww2.SAAAhq.org

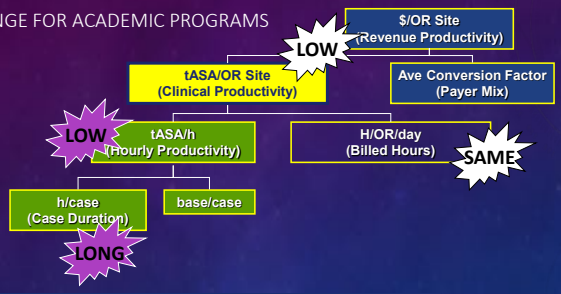
Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY



- Surgical duration affects billing productivity

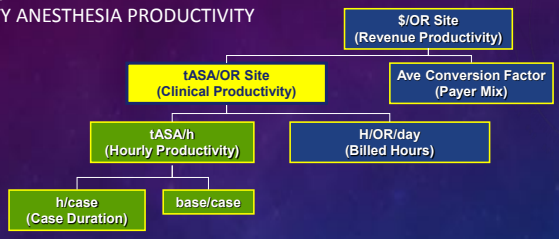
CHALLENGE FOR ACADEMIC PROGRAMS



- Less billings per OR → Less revenue
- If payer mix is not as good, then even less revenue
- Anesthesiology is supporting training surgeons

Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY



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Sites	21.0	26.0	4.0	31.4	18.0	14.5
tASA/OR						
H/OR/d						
tASA/h						
Base/case						
H/case						
Staffing Ratio						

What is Overall Clinical Productivity?

* Includes 1 Heart Hospital
2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, www.SAAAhq.org

Benchmarks by Facility Type- SAAA 2013

MEDIAN VALUES (50%)	All Groups (n=143)	All non ASC (n=111)	ASC (n=32)	AMC/ Indigent* (n=80)	Children (n=11)	Community (n=20)
Sites	21.0	26.0	4.0	31.4	18.0	14.5
tASA/OR	11,215	11,632	8,912	11,982	10,839	10,630
H/OR/d						
tASA/h						
Base/case						
H/case						
Staffing Ratio						

What determines tASA/OR?

* Includes 1 Heart Hospital
2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, www.SAAAhq.org

Benchmarks by Facility Type- SAAA 2013

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tASA/OR	11,215	11,632	8,912	11,982	10,839	10,630
H/OR/d						
tASA/h	6.7	6.7	7.4	6.5	7.3	7.1
Base/case	5.8	6.0	4.5	6.2	5.8	5.4
H/case	2.2	2.3	1.2	2.5	1.7	1.6
Staffing Ratio						

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Staffing Ratio						

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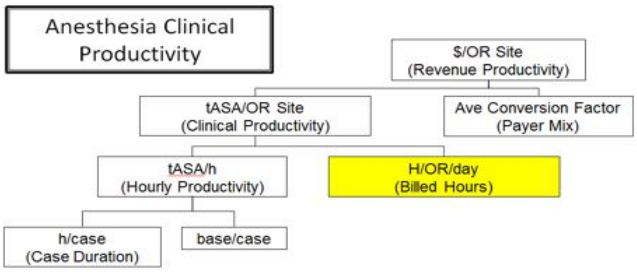

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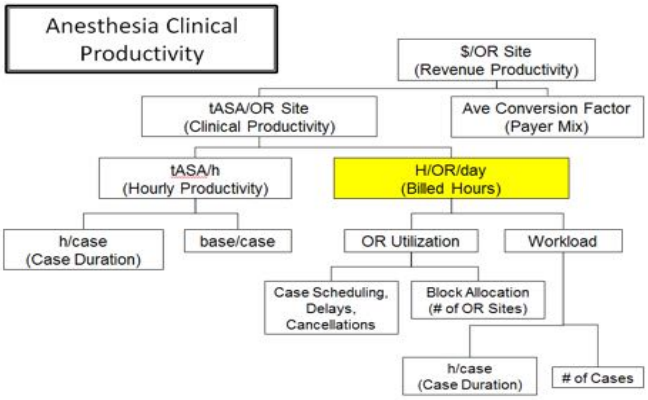

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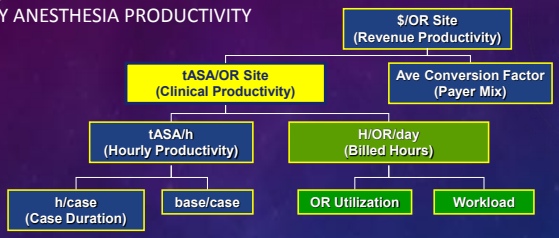
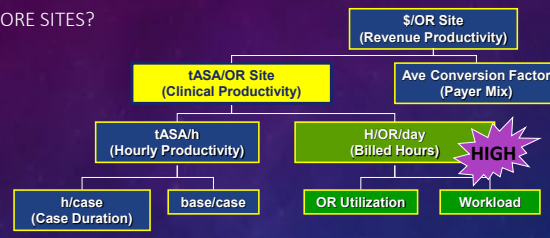
Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY



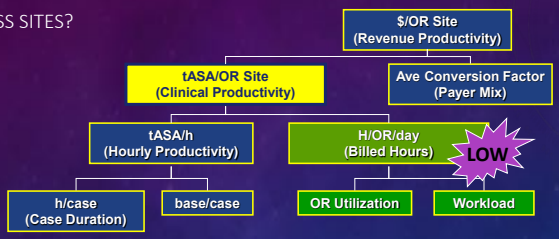
- Since billed hours are not only time spent working or in hospital.
- Difficult to measure in a survey.

NEED MORE SITES?



- More hours in evening and weekends
- Increase OR sites will reduce hours only if cases can be done during day

NEED LESS SITES?



Benchmarks by Facility Type- SAAA 2013

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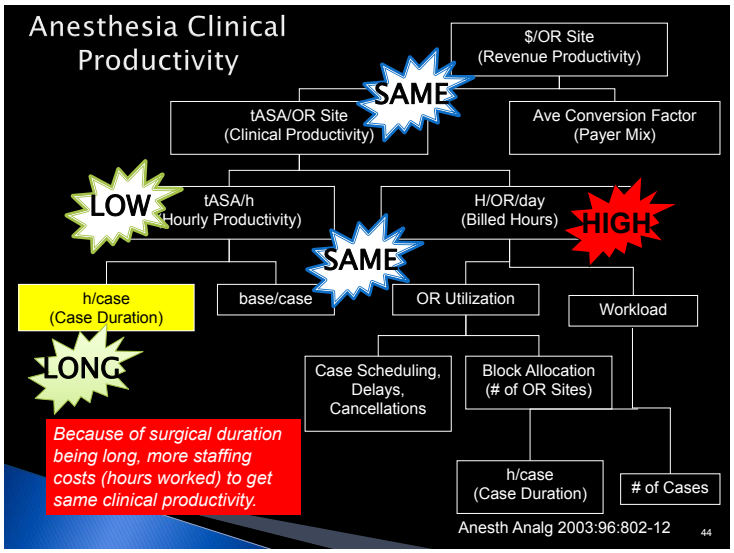
H/OR/d	6.5	6.9	4.3	7.3	6.0	6.0
tASA/h	6.7	6.7	7.4	6.5	7.3	7.1
Base/case	5.8	6.0	4.5	6.2	5.8	5.4
H/case	2.2	2.3	1.2	2.5	1.7	1.6
Staffing Ratio						

* Includes 1 Heart Hospital

2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, www.SAAAhq.org

How to use the Benchmark Data?

- Compare similar facilities
- Use to identify where to investigate more
- Use to confirm your understanding
- Example: Similar overall productivity (tASA/OR), but long surgical cases (High H/case)
- Example: Low tASA/OR but similar tASA/h



Benchmarks by Facility Type, SAAA 2013

MEDIAN VALUES (50%)	All Groups (n=143)	All non ASC (n=111)	Facility Type ASC (n=32)	AMC/ Indigent* (n=80)	Children (n=11)	Community (n=20)
Sites	21.0	26.0	4.0	31.4	18.0	14.5
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Staffing Ratio						

2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, www.SAAAhq.org

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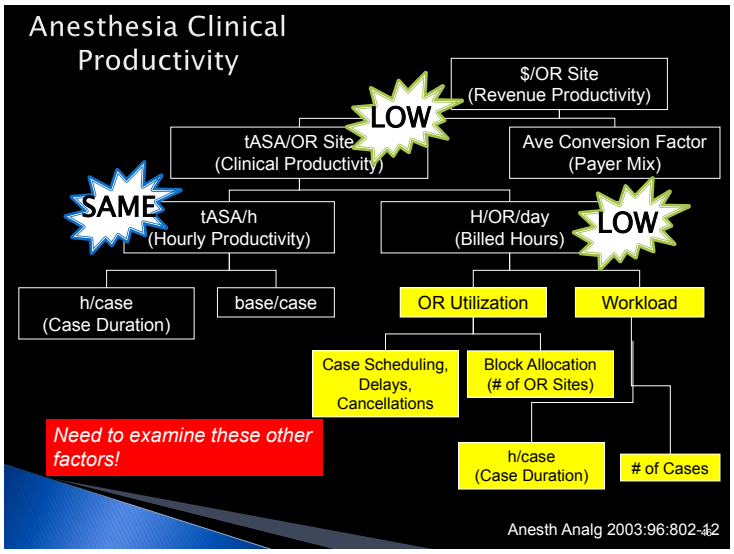

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Base/case	5.8	6.0	4.5	6.2	5.8	5.4
H/case	2.2	2.3	1.2	2.5	1.7	1.6
Staffing Ratio	1.8	1.7	2.8	1.8	1.7	1.8

*Includes 1 Heart Hospital

2013 Survey of Clinical Productivity of Academic Anesthesiology Departments, www.SAAAhq.org

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Benchmarks 2013

MEDIAN VALUES (50%)	All Groups (n=143)	All non ASC (n=111)	ASC (n=32)	AMC/ Indigent* (n=80)	Children (n=11)	Community (n=20)	Academic Only (n=57)	Mixed/ Private Practice ** (n=54)
Sites	21.0	26.0	4.0	31.4	18.0	14.5	29.0	25.0
FTE	12.0	15.0	2.0	17.0	13.0	6.0	16.0	13.0
Staffing Ratio	1.8	1.7	2.8	1.8	1.7	1.8	1.8	1.7
tASA/case	14.3	15.6	9.1	16.6	12.5	12.3	16.6	14.1
Base/case	5.8	6.0	4.5	6.2	5.8	5.4	6.2	5.8
H/case	2.2	2.3	1.2	2.5	1.7	1.6	2.5	2.1
tASA/h	6.7	6.7	7.4	6.5	7.3	7.1	6.5	6.8
Case/OR/d	3.1	3.0	3.6	3.0	3.5	3.2	2.9	3.3
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H/OR/d	6.5	6.9	4.3	7.3	6.0	6.0	7.2	6.8

*Includes 1 Heart Hospital, **Private practice only, n=3

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2013 AAAC/SAAA Clinical Productivity Report

Key Findings:

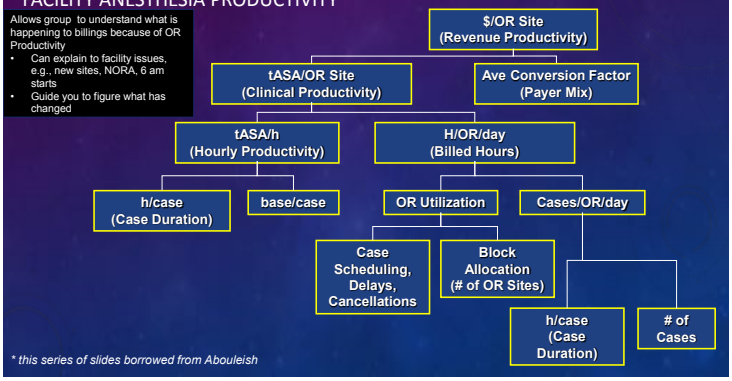
1) Similar to previous reports, ambulatory surgical centers (ASC) have different clinical productivity measurements than full-service facilities. This finding is consistent with the fact that ASC are smaller, do less complex cases, do shorter procedures, and do not function 24/7.
2) Smaller facilities (1-9 sites, 10-19 sites) were associated with shorter cases that leads to higher tASA/h productivity. The number of billed hours worked per day (H/OR/d) was less. That may be consistent with less after-hour cases and weekend cases.
3) Compared to AMC's, Children's Hospitals (not reported in 2003 report) showed lower case duration cases that leads to higher tASA/h numbers. But the overall tASA/OR was not much less despite lower H/OR/d due to this higher hour billing productivity.

AT THE GROUP LEVEL ANESTHESIA CLINICAL PRODUCTIVITY MEASURING

Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY

Allows group to understand what is happening to billings because of OR Productivity
- Can explain to facility issues, e.g., new sites, NORA, 6 am starts
- Guide you to figure what has changed



** this series of slides borrowed from Abouleish*

Anesth Analg 2003:96:802-812

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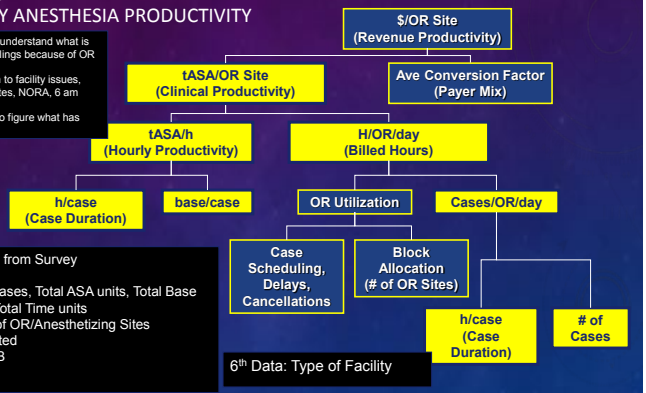


5 data points from Survey
- Billing:
  - Total Cases, Total ASA units, Total Base units, Total Time units
- Number of OR/Anesthetizing Sites
  - Estimated
  - Non OB

6th Data: Type of Facility

SURVEY DATA NOT READILY AVAILABLE

- Survey data
  - Association of Academic Anesthesiology Chairs Surveys
    - 2002 Data: Anesth Analg 2003:96:802-812
    - 2012 Data: Previously only available to to members http://anesth.utmb.edu/Public/publications/SAAAReport.pdf
  - MGMA
    - Cost Survey for Anesthesia Practices
    - Recent survey results with significantly decrease participation
      - Data still collected at the "Group Level" rather than facility level
      - 2008: n =65, 2016 n= 29
- Groups now cover multiple facilities
  - Can use methodology + add group defined additional measurements to develop Group Specific Dashboard
    - Call, utilization, FTE, late rooms
  - When comparing facilities – remember to compare "like-facilities"
  - Year-to-Year goals and comparisons per facility

INTERNAL COMPARISONS: YOU DEFINE THE MEASUREMENT

- Although "Per FTE" measurement is not meaningful when comparing productivity externally, you can use it internally.
- Hudson et al. describes UPMC experience in using
  - Must understand how calculate the FTE and apply same definition
  - Factors influencing
    - OR FTE rather than total FTE
    - Concurrency or staffing ratio
    - In house call or at home call

Hudson ME, Lebovitz. Anesthesiology Clinics, In Press 2018
Sakai T, Husdon M, et al Br J Anaesth, 2013 (4):636-50

Figure 3. Correlation of tASA/FTE with factors impacting productivity

Sakai T, Husdon M, et al Br J Anaesth, 2013 (4):636-50

tASA/FTE MEASUREMENT: PRODUCTIVITY FROM ANESTHESIA CARE (NON OB)

Measurement does not include:
- other billable work (Lines, OB, acute pain, chronic pain, ICU, Consults)
- non-billable work (DSU preop, PACU, Schedule Runner)

tASA/FTE MEASUREMENT: PRODUCTIVITY FROM ANESTHESIA CARE (NON OB)

$$\frac{tASA}{FTE} =$$

Measurement does not include:
- other billable work (Lines, OB, acute pain, chronic pain, ICU, Consults)
- non-billable work (DSU preop, PACU, Schedule Runner)

tASA/FTE MEASUREMENT: PRODUCTIVITY FROM ANESTHESIA CARE (NON OB)

$$\frac{tASA}{FTE} = \frac{tASA}{OR}$$

Measurement does not include:
- other billable work (Lines, OB, acute pain, chronic pain, ICU, Consults)
- non-billable work (DSU preop, PACU, Schedule Runner)

tASA/FTE MEASUREMENT: PRODUCTIVITY FROM ANESTHESIA CARE (NON OB)

$$\frac{tASA}{FTE} = \frac{tASA}{OR} \frac{OR}{ORFTE}$$

Measurement does not include:
- other billable work (Lines, OB, acute pain, chronic pain, ICU, Consults)
- non-billable work (DSU preop, PACU, Schedule Runner)

ORFTE = regular weekdays providing surgical anesthesia / total workdays available
FTE = full time equivalent

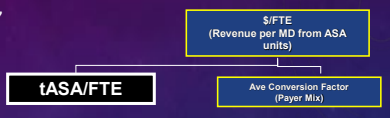
tASA/FTE MEASUREMENT: PRODUCTIVITY FROM ANESTHESIA CARE (NON OB)

$$\frac{tASA}{FTE} = \frac{tASA}{OR} \frac{OR}{ORFTE} \frac{ORFTE}{FTE}$$

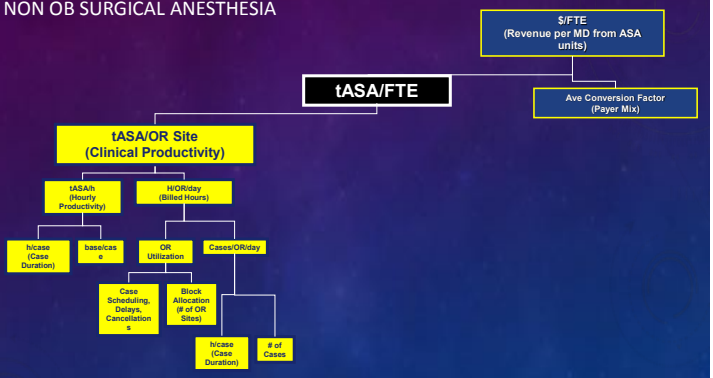
Measurement does not include:
- other billable work (Lines, OB, acute pain, chronic pain, ICU, Consults)
- non-billable work (DSU preop, PACU, Schedule Runner)

ORFTE = regular weekdays providing surgical anesthesia / total workdays available
FTE = full time equivalent

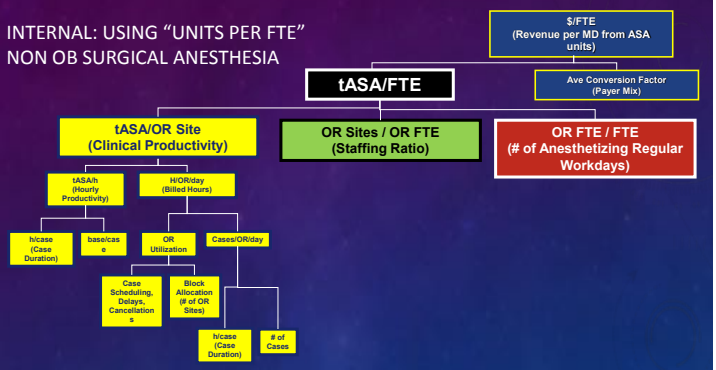
INTERNAL: USING "UNITS PER FTE" NON OB SURGICAL ANESTHESIA



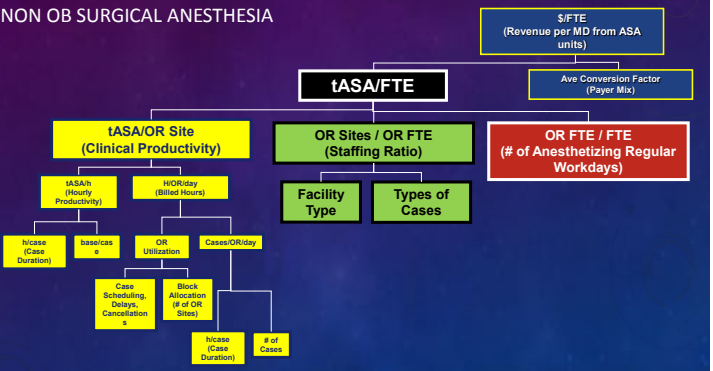
INTERNAL: USING "UNITS PER FTE"
NON OB SURGICAL ANESTHESIA



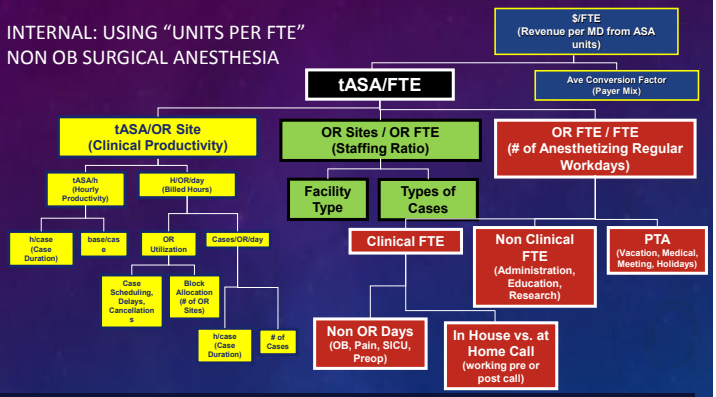
INTERNAL: USING "UNITS PER FTE"
NON OB SURGICAL ANESTHESIA



INTERNAL: USING "UNITS PER FTE"
NON OB SURGICAL ANESTHESIA



INTERNAL: USING "UNITS PER FTE"
NON OB SURGICAL ANESTHESIA



Hudson ME, Lebovitz EE. Measuring clinical productivity. Anesthesiology Clin 2018; 36(2): In Press.
Hudson ME. Benchmarking anesthesiologists' performance: Understanding factors that impact productivity. ASA Monitor 2016;80(6):40-42
Sakai T, Husdon M, et al Br J Anaesth, 2013 (4):636-50

TAKE HOME MESSAGES

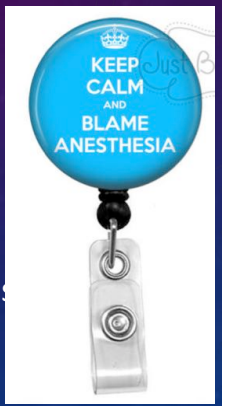
- Group/Facility productivity is often a surrogate to OR productivity
- Use algorithm to understand your dashboard
- Many factors can affect measurements
- Compare like-facilities to minimize these factors
- Internal comparisons allow for you to control and define the measurements to your specifications

REALITY

Healing is an Art

Medicine is a Science

Healthcare is a Busines



My observation in running a large Department,
AND SPEAKING TO OTHER CHAIRS, is that there is a shifting emphasis to concurrency rates, by hospital administration.
Many of us are also seeing capitated fees for the MD portion of a case involving a CRNA.

Other Findings

- Breakdown by number of sites, type of surgical staff (academic or mixed private/academic)
- Staffing ratio

AT THE GROUP LEVEL

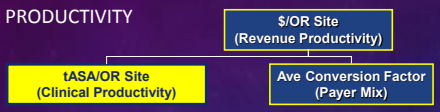
ANESTHESIA CLINICAL PRODUCTIVITY

MEASURING

THIS GROUP OF SLIDES IS ADAPTED FROM ABOULEISH

Anesth Analg 2003:96:802-812

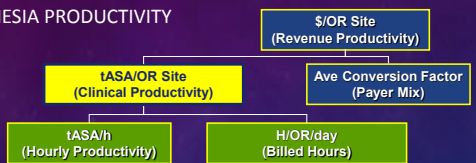
FACILITY ANESTHESIA PRODUCTIVITY



- Overall Clinical Productivity

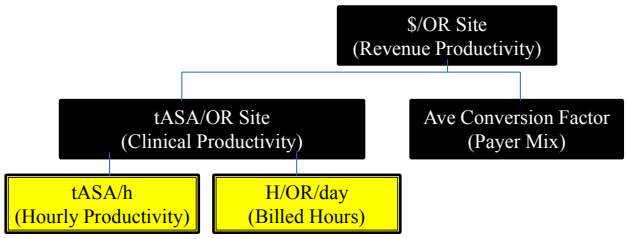
Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY



- Two measurements determine overall clinical productivity.

Anesthesia Clinical Productivity

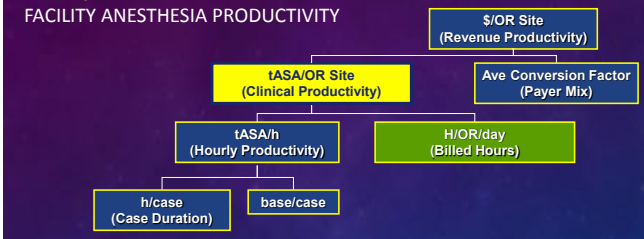


$$tASA/h = \frac{(base\ unit + time\ unit)}{(time\ unit/4)}$$

74

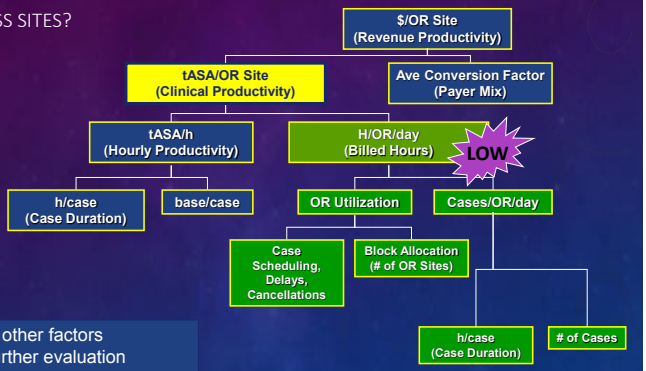
Anesth Analg 2003:96:802-812

FACILITY ANESTHESIA PRODUCTIVITY



- Billed hours only.

NEED LESS SITES?



- Signals other factors
- Need further evaluation