



Cost Effectiveness Analysis (CEA) Best Practices

Juan F. Quintana CRNA, DNP

CEA



CEA

- **powerful tool**
- **prioritize resources for health care.**

“CEA lies at the heart of perhaps the ultimate health policy question: how can we get good value for our money?”
(Neumann, 2005)

CEA

Opposition: “Isn’t cost effectiveness analysis just a smoke-screen for cutting costs at the expense of quality?” (Eddy, 1992)

Quality

Over 50 years
at least 25 studies

Results - essentially no difference in
outcomes

Anesthesia is very good!!!

Quality



RTI and Crowell, J (2010)

Needleman, J. and A. F. Minnick (2009).

Simonson, D. C., M. Ahern, et al. (2007).

Quality



6 Sigma

The level of errors per million procedures under anesthesia approaches 6 Sigma (Lema, 2003; Luchsinger & Pexton, 2004).



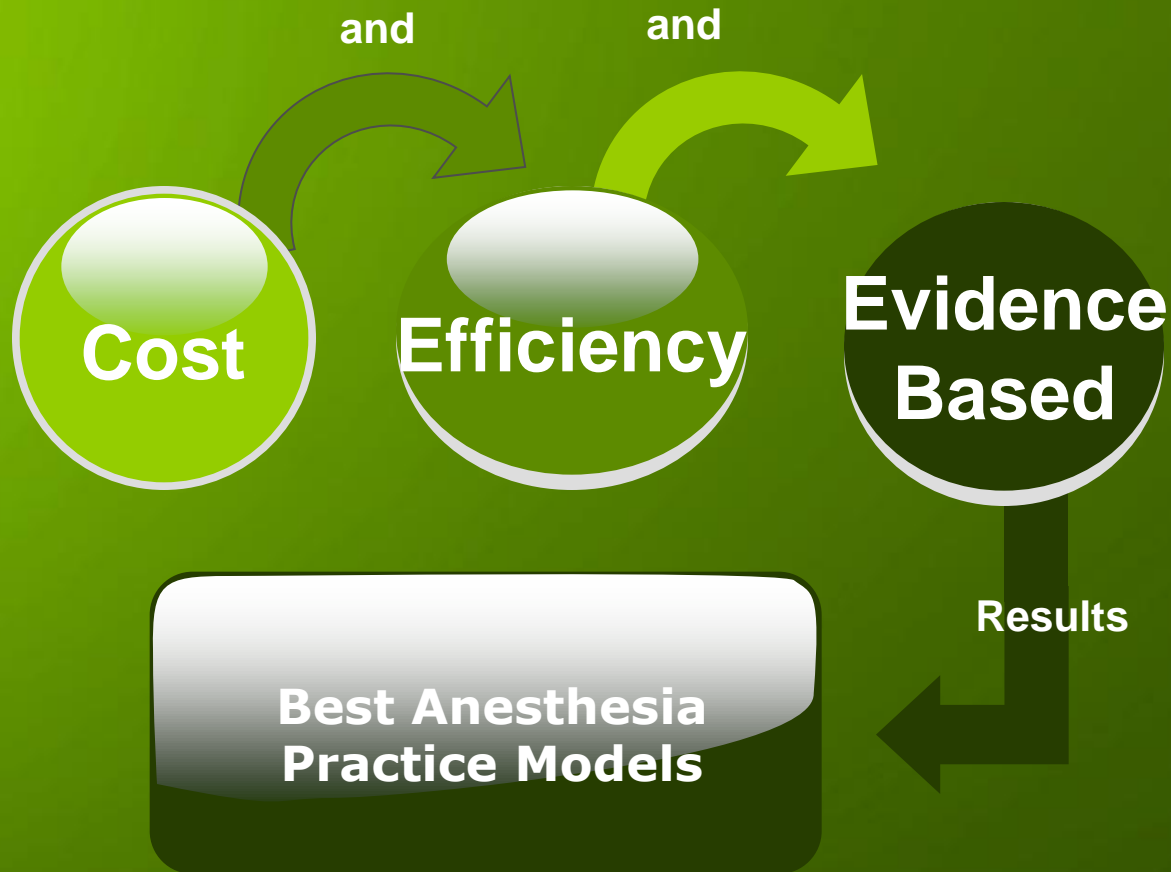
Cost Identification Analysis

by Juan F. Quintana CRNA, DNP

- The most frequently utilized in anesthesia.
- Utilized when outcomes are EQUAL, but the cost of comparable outcomes IS NOT.
- A rigorous determination of the costs.

“The presumed goal for this analysis is to find the least-expensive way to achieve the outcomes.” (Sperry, 1997)

Tying CEA to Evidence Base



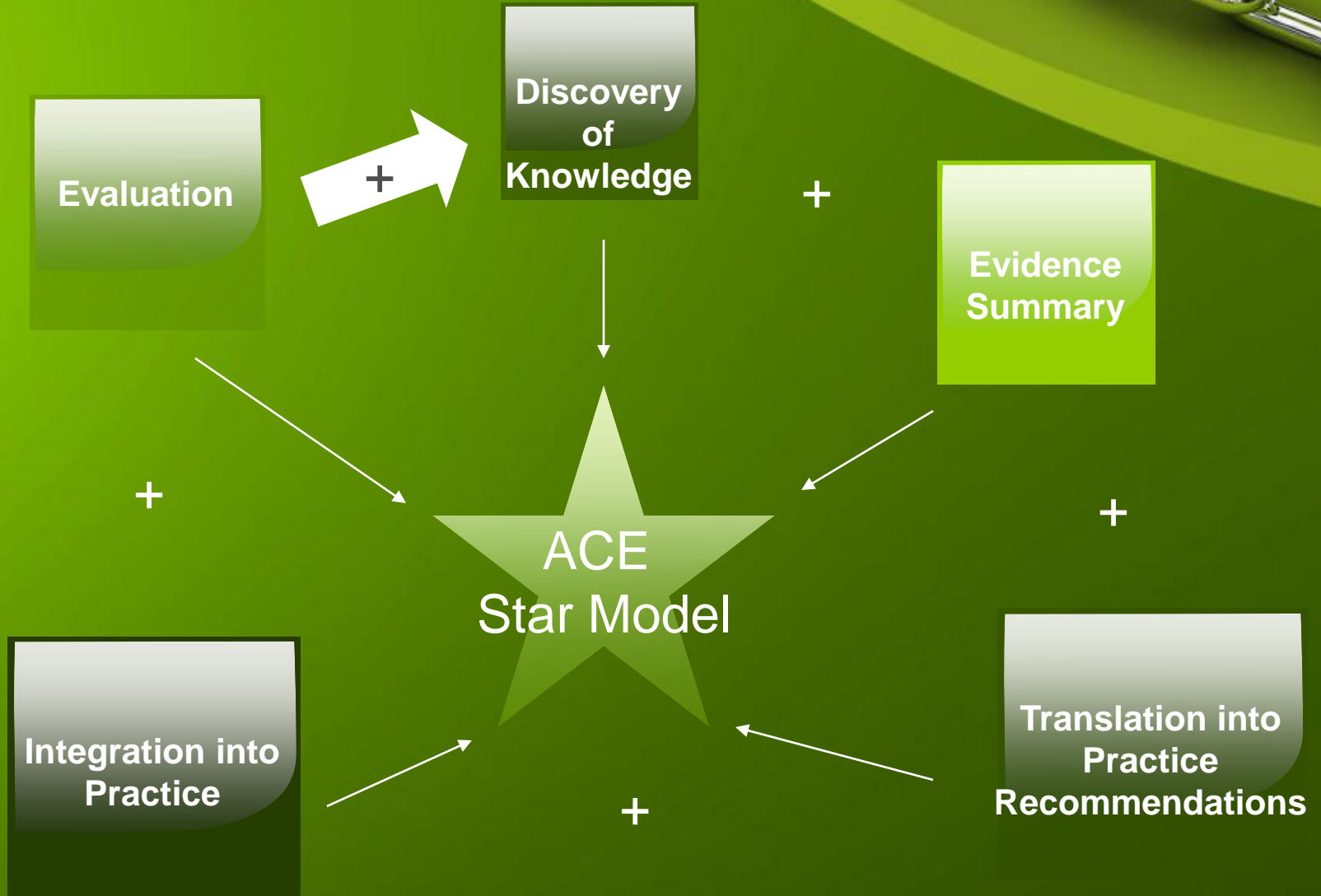


Academic Center for Evidence

Academic Center for Evidence-Based Practice (ACE) Star model

- knowledge transformation
- integrates old and new concepts of improving care
- provides a framework to organize EBP processes and approaches (Stevens, 2004).


Knowledge Transformation




Discovery of Knowledge



WWW
Literature review
Anesthesia
Providers
Administrators

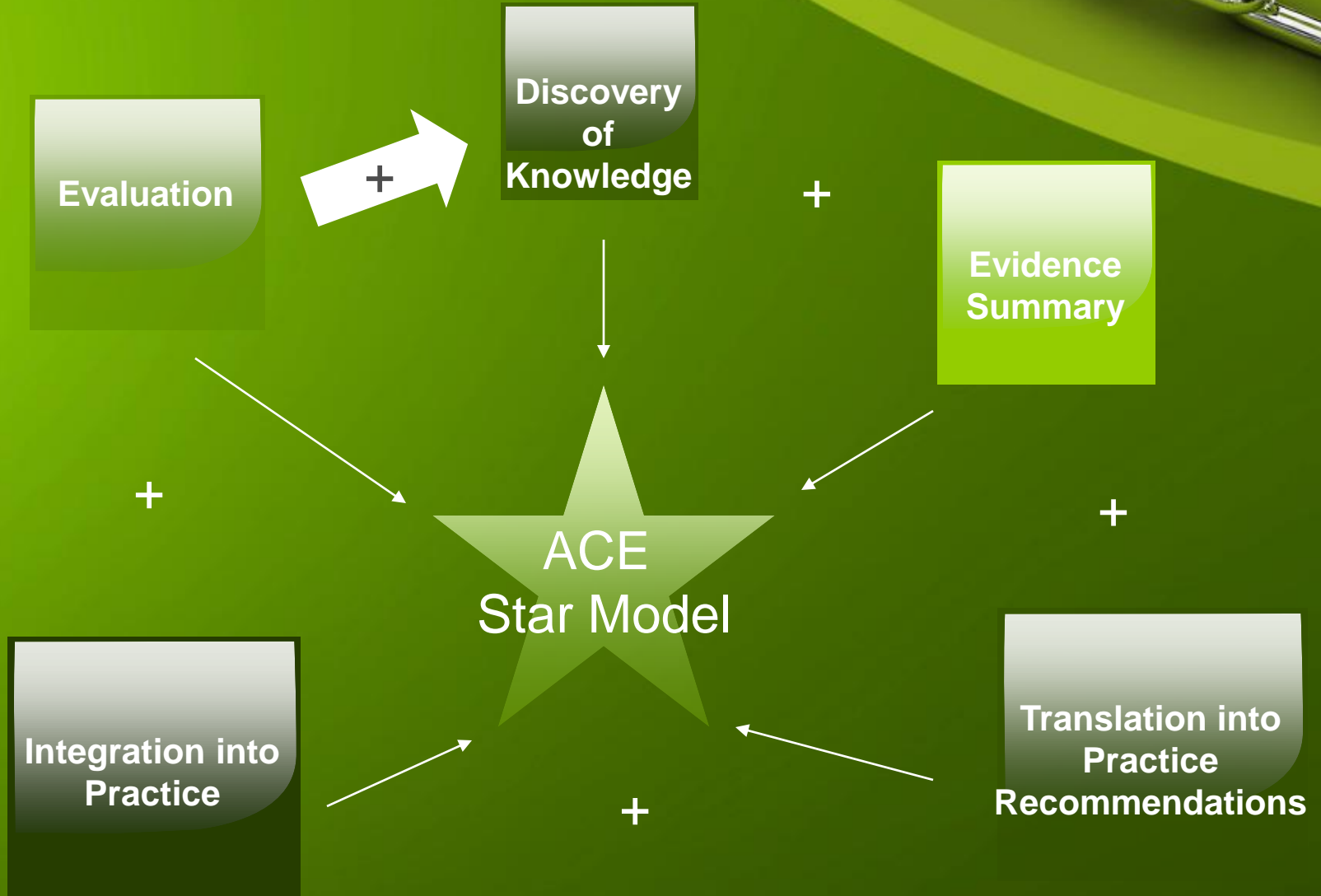


Are US healthcare facilities optimizing revenue by using efficient anesthesia practice models to meet the requirements of their anesthetizing locations?



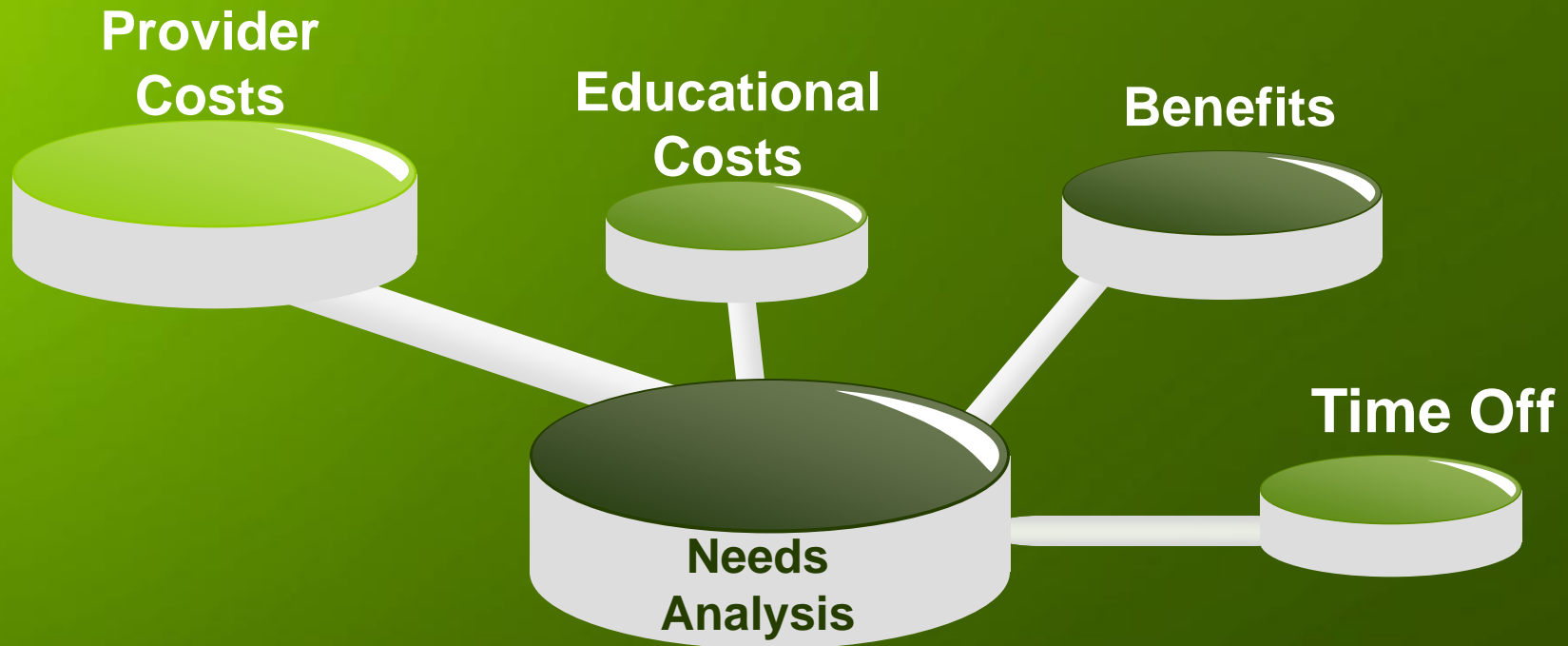
Does an increase in CRNA autonomy leads to cost saving?

Knowledge Transformation



CEA

Evidence Summary



Evidence Summary Needs Analysis

- 1 **US spends more than any other country on Healthcare**

- 2 **Healthcare exceeds 16% of GDP**

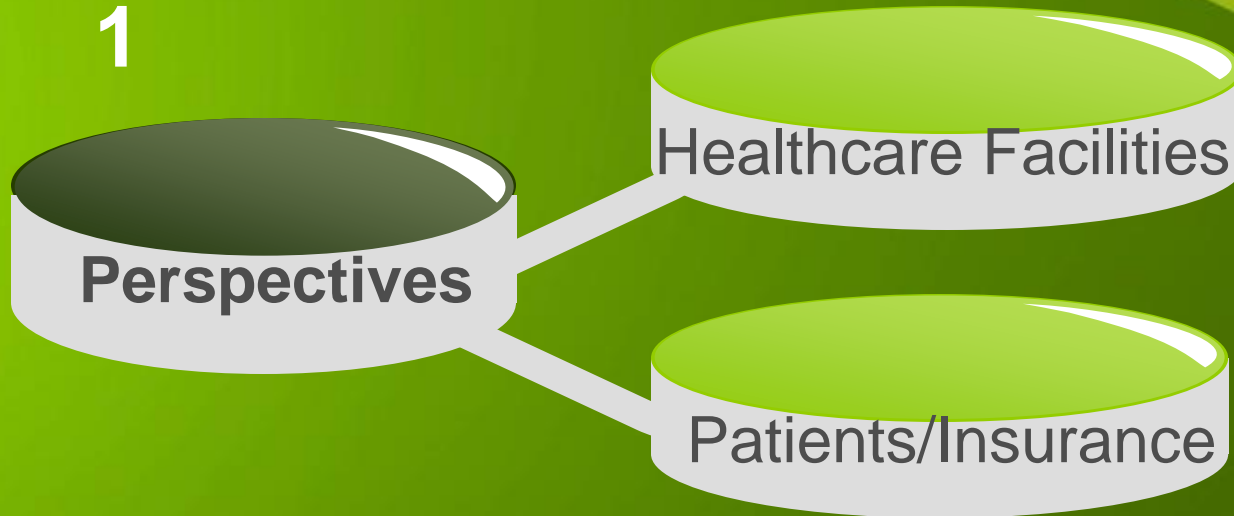
- 3 **Anesthesia Stipends continue to Increase**

- 4 **Healthcare Reform**

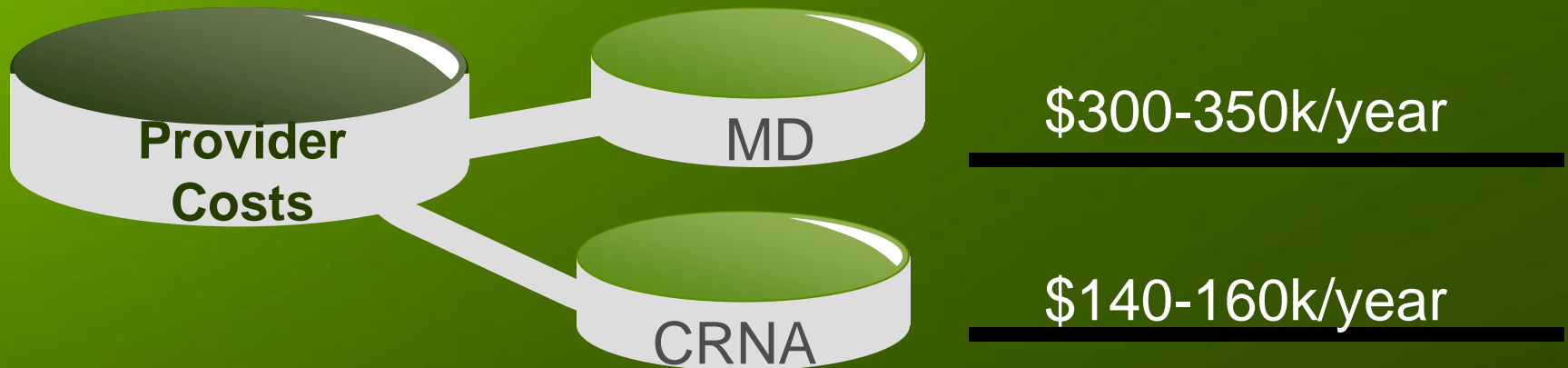
Evidence Summary

Current Costs

1



2



Evidence Summary

Educational Costs

1



BS degree = 4 years
Med School = 4 years
Residency = 4 years
Total time = 12 years
Less 3 years = 9 years
Average cost **\$635,348**

2



BS(N) degree = 4 years
Acute Care = 1.5 years**
CRNA Education = 2.7 years
Total time = 9.2 years
Less 1.5 years = 5.2 years
Average Cost **\$59,153**

Evidence Summary

Benefits

Benefits 30-35% of Salary:

Healthcare

Life Insurance

Disability

Retirement

~ Neutral Both benefit

Evidence Summary

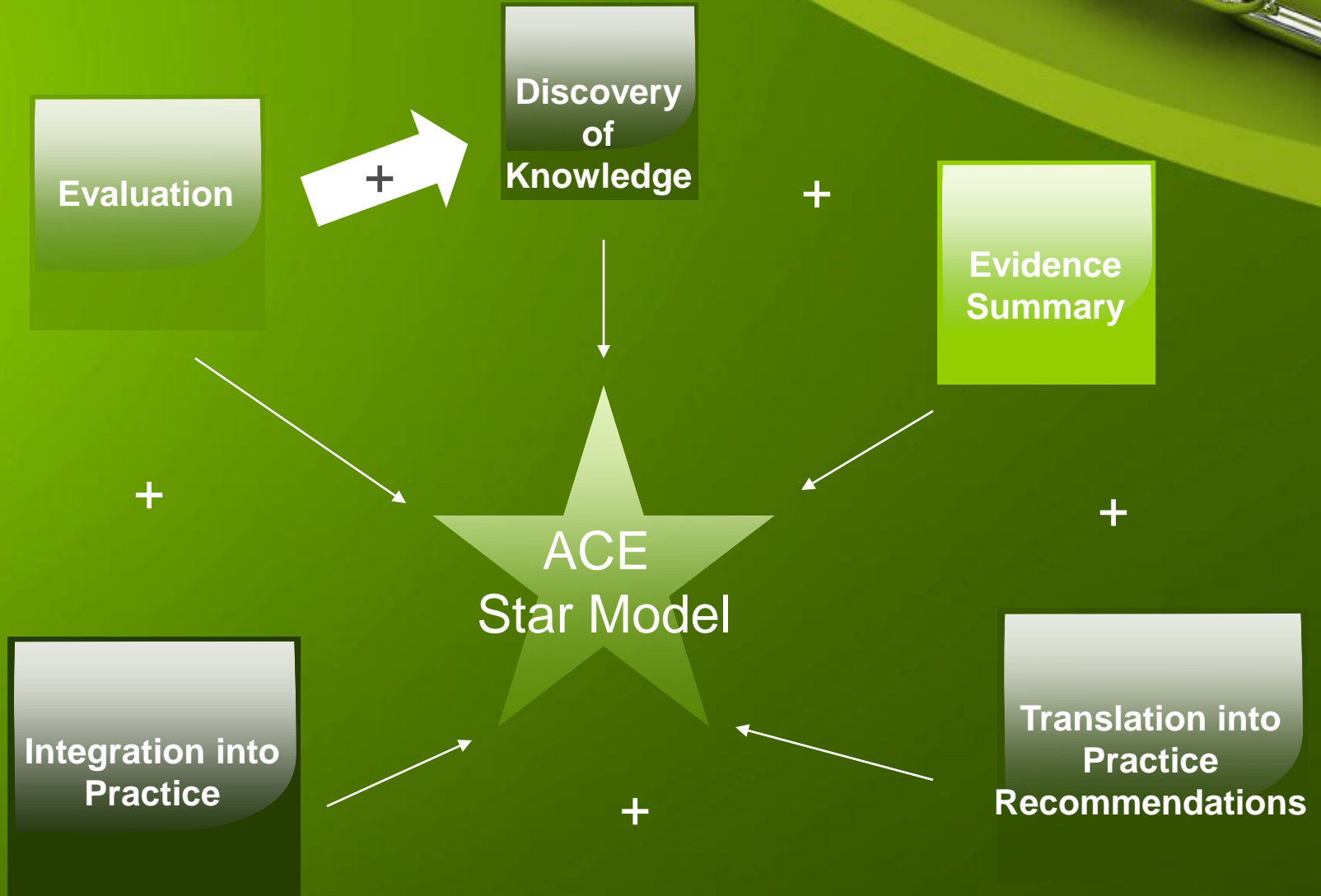
Time Off

MDA 4-8 weeks /year

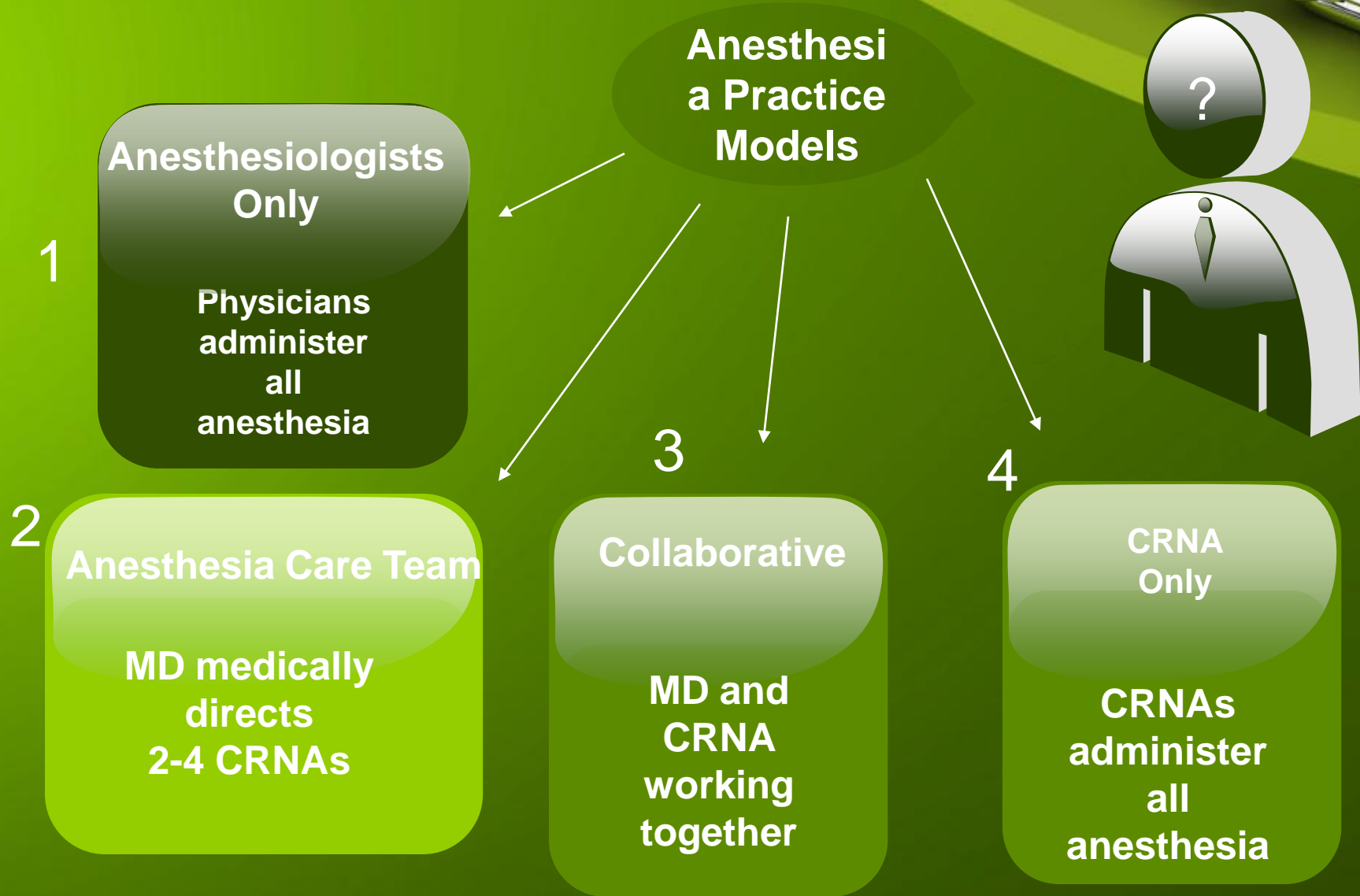
CRNA 4-6 weeks /year

Average 5 weeks utilized for this study

Knowledge Transformation



Translation into Practice



Translation into Practice



AVERAGES

Conversion Factor (CF):

Non-Teaching - \$32.00

Teaching - \$31.0

(Abouelish, 2001; Beirstein, 2003, Kheterpal, 2009)

Translation into Practice

AVERAGES

Determination of Total Procedures Per Day

Average units/procedure (6 TM or 1.5 hours)		90 min
• Average turnover time	+	<u>30 min</u>
• Average time/procedure	=	120 min
• (2 hours)		
• Routine operating hours		8 Hrs/day
• Total time per procedure		2 Hrs/procedure
		4 procedures/day

(Harders, 2007; Dexter, 2005)

Translation into Practice

AVERAGES

Units /Procedure

Non-Teaching facility

10 units

Teaching Facility

12 units

Translation into Practice

AVERAGES

Potential Reimb. Non-Teaching (12)

$\$32/\text{unit} \times 10 \text{ units} = \$320/\text{procedure}$

$\$320/\text{proc.} \times 4.5/\text{day} = \$1440/\text{day}$

$12 \times \$1440/\text{day} \times 255 \text{ days/year}$

$= \$4,134,751/\text{year}^*$

*Reduced by cost of billing (8%)

Translation into Practice

AVERAGES

Potential Reimb. Teaching (36)

\$31/unit x 12 units = \$372/procedure

\$372/procedures x 4/day = \$1488/day

36 x \$1488/day x 255 days/year

= \$12,567,053/year*

*Reduced by cost of billing

Translation into Practice



Anesthesiologist Only

Cost in Non-Teaching Facility 12 locations

16 MDs x \$350,000 = \$5,600,000/year

Potential Reimbursement = \$4,134,751/year

Net Gain/Loss = **-\$1,465,249/year**

Translation into Practice



Collaborative

Cost in Non-Teaching Facilities with 12 locations

3 MDA x \$350,00

+ 13 CRNAs x \$180,000 = \$3,390,000/year

Potential Reimbursement = \$4,134,751/year

Net Gain/Loss = \$ 744,751/year

Translation into Practice



CRNA Only

Cost

16 providers x \$200,000 = \$3,200,000/year

Potential Reimbursement = \$4,134,751/year

Net Gain/Loss = \$ 934,751/year

Translation into Practice



ACT - Non-Teaching Facilities 12 locations

Cost (1:4 ratio)

4.5 MDA x \$321,000

+ 16 CRNAs x \$160,000 = \$4,004,500/year

Potential Reimbursement = \$4,134,751/year

Net Gain/Loss = \$ 130,251/year

Translation into Practice



ACT - Non-Teaching Facilities adjusted for Delays r/t Medical Direction (12 Locations)

Cost	= \$4,004,500/year
Potential Reimb.	=\$3,674,494/year
Net Gain/Loss	= -\$330,006/year

Translation into Practice

ACT - Teaching Facilities with 36 locations
(1:2 ratio)

Cost

36 MDA x \$321,000 = \$11,556,000/year

18 CRNA x \$160,000 = \$ 2,880,000/year
\$14,436,000/year

Potential Reimb. = \$12,567,053/year

Net Gain/Loss = **-\$1,868,947/year**

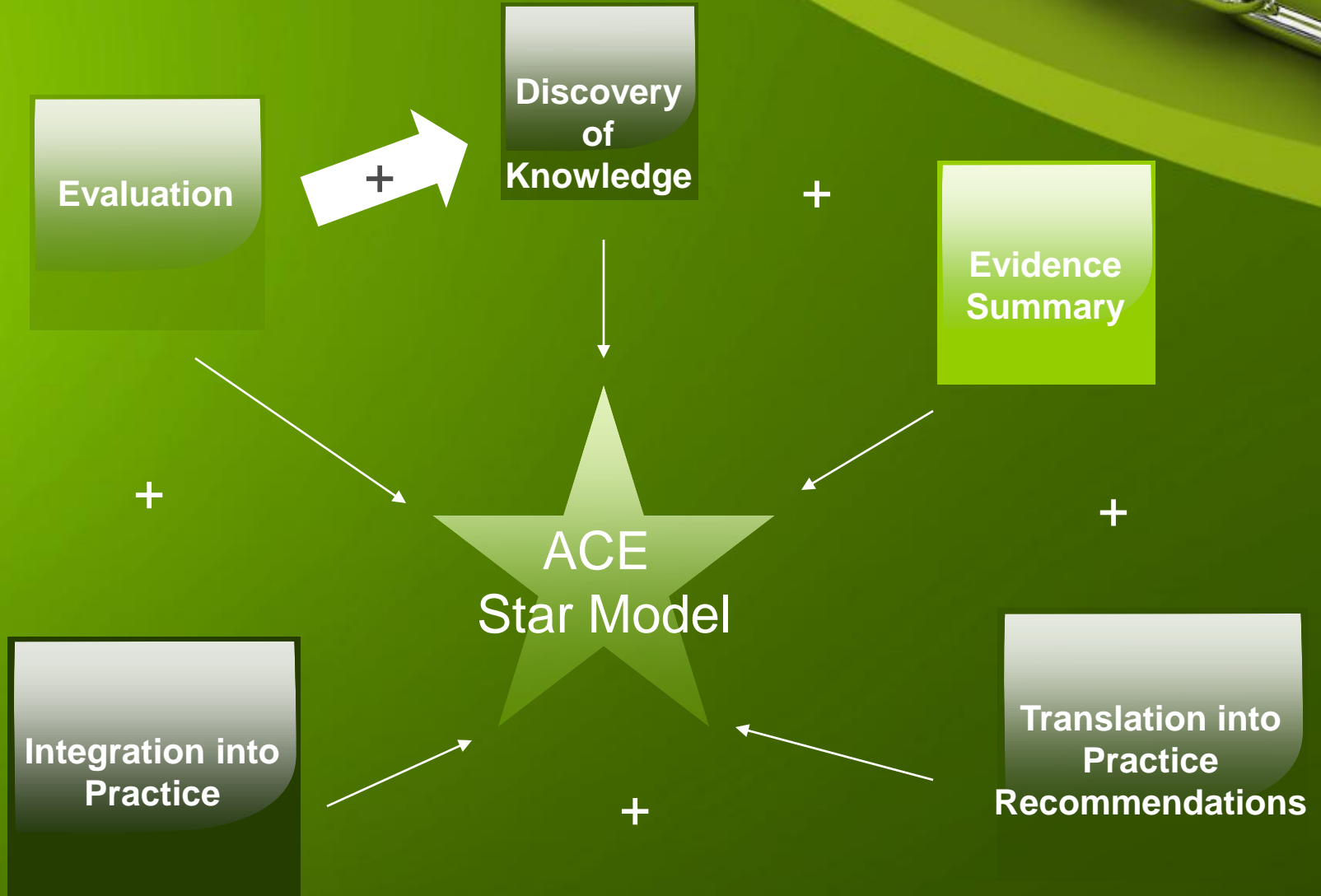
Translation into Practice



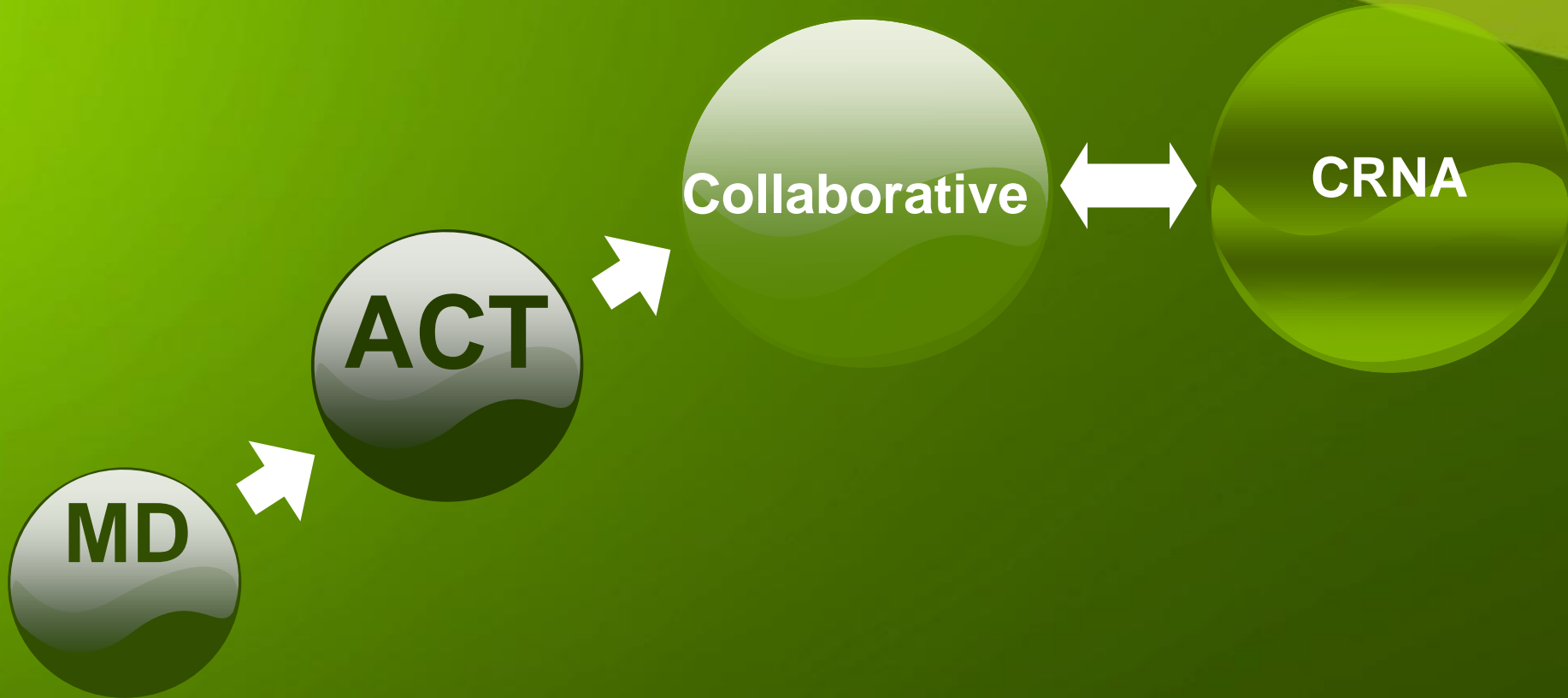
ACT - Teaching Facilities adjusted for
Delays r/t Medical Direction (16 locations)

Costs	= \$14,436,000/year
Potential Reimb.	= \$10,996,171/year
Net Gain/Loss	= -\$3,439,829/year

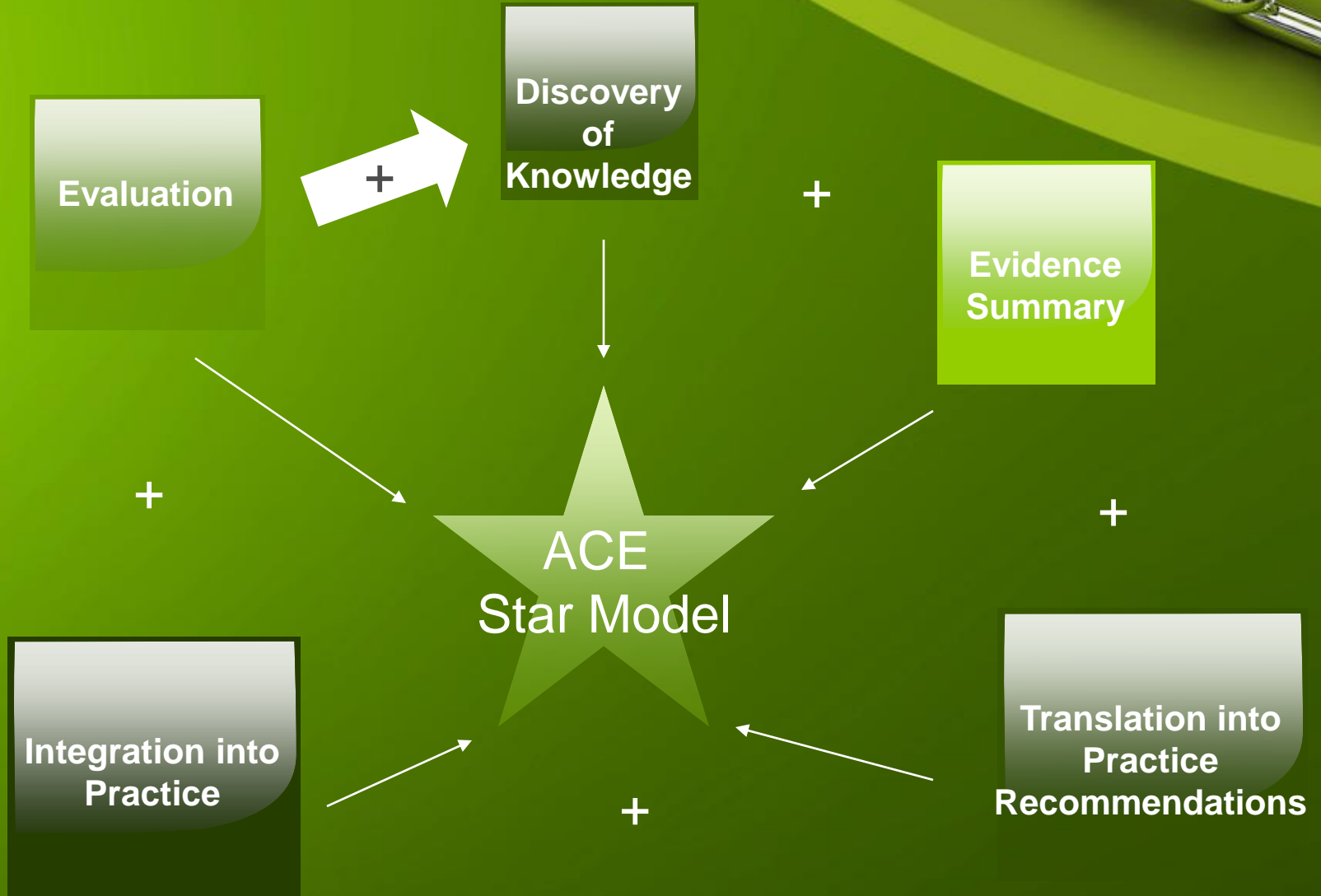
Knowledge Transformation



Integration & Evaluation



Knowledge Transformation



Study



Question 1 - Yes and No, Some US facilities optimize anesthesia practice models

Question 2 - Increased CRNA autonomy definitely results in increased cost-effectiveness



Juan F Quintana CRNA, DNP

a_sleeper2@yahoo.com

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