



Synthesizing the Evidence

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Conflicts of Interests

- No conflicts of interest.



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Presenter Acknowledgement

- Many slides in this presentation have been created by The Ohio State University College of Nursing Fuld Institute for EBP and are used in their 5-day EBP Immersion class where I volunteer as an EBP mentor.

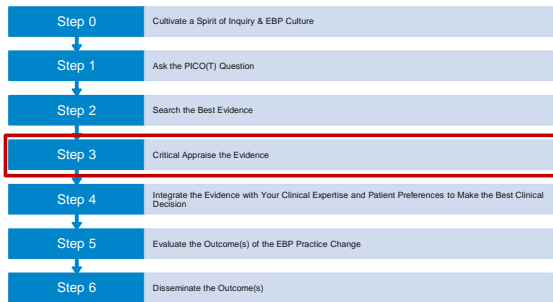


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Steps of EBP



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Evaluation/Summary vs Synthesis

- | | |
|---|--|
| <p>1 Evaluation/Summary- about individual "keeper" articles</p> <ul style="list-style-type: none"> > Extract key pieces of information > Get organized | <p>2 Synthesis- about a body of evidence</p> <ul style="list-style-type: none"> > Combines evidence from individual articles > Develop evidence-based recommendations |
|---|--|

Tool to use:
Evaluation/Summary Table

Tool to use: Synthesis Table



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Evaluation/Summary Table

Citation	Conceptual Framework	Design/ Method	Level of evidence	Sample/Setting	Major Variables/ Interventions Studied	Outcome Measurement	Data Analysis	Findings	Quality of Evidence
Author Year Title				Number (N) Characteristics Inclusion/ Exclusion criteria Attrition	Independent & dependent variables (IV) Intervention & outcomes	What scales were used? Psychometric info	What statistics were used?	Quantitative and/or qualitative findings	Strengths Limitations Risk or harm if implemented Applicability/ Feasibility
Keeper Article 1									
Keeper Article 2									

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Beginning way to Identify Trends

First author, year and title	Design/ Method	Sample/ Setting	Major Variables Studied	Data Analysis	Findings	LOE	Quality of Evidence
Warren, 2019	EBP	Sample: 600 Inpatient adult Setting: Teaching hospital in Midwest	-Critical Care Bundle -Quality equipment -Staff Education -Protocol -Algorithm	Descriptive Statistics, CI	-50% reduction in NVHAP -Decrease in mortality -Decrease cost (\$1.04 mil)	II	Strength: calculate 50% "true sample" Weakness: do not indicate which interventions do not influence results as a "quality equipment"
Gaith, 2020	Literature review	41 articles that reviewed interventions for non-ventilator hospital acquired pneumonia	-Critical Care Bundle -PICO2020 -Quality equipment -Appropriation -Precautions	Descriptive Statistics	-Decrease in NVHAP	VI	Strength: review multiple articles and synthesize Weakness: unsure if patient populations are uniformed
Muero 2018	QI	Sample: 104 hospitalized adults in non-ICU setting Setting: Community hospital	-Critical Care Bundle -Staff Education -Protocol -Quality equipment	Descriptive Statistics, CI	-Decrease in NVHAP -Decrease mortality rate -Decrease cost (\$1.08 mil)	II	Strength: multiple patients, detailed intervention Weakness: quality of patients is low
Lacerna, 2020	EBP	Sample: 280 hospitalized adult patients Setting: VA hospital	-Critical Care Bundle -Quality equipment -Mobility	Descriptive Statistics, CI	-Decrease NVHAP -Decrease mortality rate -Decrease LOS -Decrease ATB use	II	Strength: lots of resources, detailed intervention Weakness: unclear if interventions and may not be applicable to any setting

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Synthesis

- What is Synthesis
 - > Compiles information together in a different way by combining elements in a new pattern or proposing alternative solutions.
- High level thinking skill
- More than a list, description, comparison, examination...
- Helps with decision making to move forward



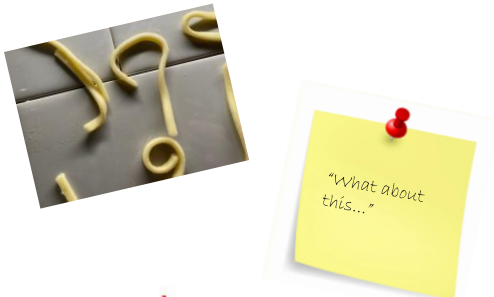
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Principles of Synthesis

- Synthesis is the combination of individual things to create something new
- Synthesis reflects thoughtful analysis of the similarities and inconsistencies across studies
- Synthesis captures the gestalt of the multiple facets of the body of evidence
- Synthesis reflects consensus drawn from multiple studies
 - > Consensus on implications of findings
 - > Consensus on major conclusions for critical outcomes, effective interventions, and strategies

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What Synthesis Helps Stop



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Why Use a Synthesis Table?

Synthesis tables:

- Are visual representation of the consolidation of the "themes" that emerge.
- Should be used to support any evidence-based recommendations.
- Help the group/team and key stakeholders with decision making.

*You can create as many tables as you need to help answer the question

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Level I: Systematic Review of Meta-analysis	X(17)	X(275)	X(44)												
Level II: Randomized Controlled Trial	X(26)	X(16)	X												
Level III: Controlled Trial without Randomization	X(30)														
Level IV: Case-control or Cohort Study	X(41)			X	X										
Level V: Systematic Review of Qualitative or Descriptive Studies	X(54)														
Level VI: Qualitative or Descriptive Study (includes evidence implementation projects)	X(93)	X(26)			X	X	X	X	X	X	X	X	X	X	X
Level VII: Expert Opinion or Consensus	X(31)														

Synthesis Table: Levels of Evidence

1. Chou PL, et al. (2010); 2. McLaughlin J, et al.; 3. Wilson BJ, et al.; 4. Wilson K, et al.; 5. Sivak R, et al.; 6. Chou PL, et al. (2010); 7. Gattuso M, et al.; 8. Miller, et al.; 9. Chou PL, et al.; 10. Institute of Medicine; 11. Chou PL, et al.; 12. Stewart J, et al.; 13. Brown L, et al.; 14. Haker C, et al.; 15. Bader M, et al.

From Overholt, S., Nims, R.M., Dillwell, S.B., & Williamson, K.M. (2010). Evidence-based practice: step by step. *Clinical American Journal of Nursing*, 11(11), 43-51.



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Synthesis tables are fun!

Synthesis tables answer your questions!

Synthesis of key factors related to New York City Pizza

	1	2	3	4	5	6
Taste	★★	★★	★★★	★★★★	★★★★	★★★★
Distance	🚶	🚶	🚶	🚗	🚗	🚗
Price	\$	\$\$	\$\$	\$	\$\$	\$\$
Slices	Y	N	N	Y	N	N



LEGEND: (1) Pizza Park- 1st bt 66th & 67th, (2) Patsy's- 69th & 1st (3) Motorino- 1st Ave and 12th St (4) Joe's- Carmine St (5) Keste- Bleecker St (6) Ribalta 12th & Broadway
★★ Good, ★★★ Best

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Synthesis Tables Examples

Clinical Inquiry:

- My organization uses a lot of central lines due to "poor venous access," can we reduce the number of central lines placed through the use of ultrasound guided IVs?

PICOT Question:

- In adult hospitalized patients in need of intravenous (IV) access, how does ultrasound guided IV starts compared to standard IV starts affect the number of central lines?

Example: Synthesis of the Levels of Evidence

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		
II	✓									(5)																		(9)	✓
III										(2)																			(1)
IV																													
V																													
VI																													
VII																													

*Systematic reviews with meta-analysis, but not all RCTs



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Example: Synthesis of Outcomes of USGPV Placement

LOE	VI	2	3	6	7	8	10	12	13	14	17	22	24	25	26	27
CVCs	↓															
USGPV Success	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Time	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Attempts	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Pain	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Patient Satisfaction	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

Legend:
LOE: levels of evidence CVCs: Central venous catheter USGPV: Ultrasound-guided peripheral intravenous

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Example: Synthesis of Provider Placing the USCPV

Provider	1	2	3	4	5	6	7	8	9	13	14	15	17	18	19	20	21	22	23	24	26	27	
EDT																							
RN		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
CRNA																							
MD	✗																						

Legend:
EDT: emergency department technician RN: registered nurse
CRNA: certified registered nurse anesthetist MD: doctorate of medicine

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Example: Synthesis of Components of USGPiVs Placement Education

Educating Provider	2	3	4	5	9	16	18	20	21	22	23	27
Total Length (Mins)	90	60	45 (x3)	90	150	120	180	180	120	180	240	120
Length Of Didactic (Mins)				90		120			30	60	120	
Length of Skill (Mins)				60		60			90	60	60 (x2)	
Skill Images												
Videos	√	√	√		√				√			
Real Live Practice					√				√	√	√	√
Phantom Arm Practice		√	√	√		√		√	√	√	√	√
Number Supervised	10				5	5	10	25		3		

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Example: Synthesis of Content in USGPiV Education

	3	5	9	17	20	21	22	23	27
US Machine Use			√		√				√
US Machine Disinfection								√	
US Physics/Image Acquisition	√	√	√	√		√	√		
Technique Explanation	√	√	√			√	√		
Upper Extremity Anatomy			√		√	√	√	√	
Complications			√					√	
Documentation			√						

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Evidence-based Recommendations

- USGPiV should be implemented to reduce the number of central line placements.
- RNs and MDs should be trained to place USGPiVs.
- A 140-minute class with didactic and skills is needed. The training needs to include:
 - Image Acquisition
 - Anatomy
 - Etc.

Examples of Helpful Synthesis Tables

- Focus: Implementation a rapid response team
 - Helpful tables include outcomes, make up of the RRT team, training of the RRT team members.
- Focus: Making a change to a tool (e.g. pain scales, skin assessment, etc.)
 - Helpful tables include outcomes in how the tool is performing compared to others, what components are in each tool, etc.
- Focus: Implementing bedside rounds
 - Helpful tables include outcomes, disciplines who are present at rounds, things that contribute to the success of rounds, etc.



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Making a Decision

Synthesis tables help discussions address:

- Confidence
- Feasibility
- Harm of
 - making a practice change
 - Not making a practice change



Thank you!

“Not acting on the existing evidence is no longer an option for clinicians.”

-Melnyk & Fineout-Overholt, 2011



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References

- Fineout-Overholt, E., Cleary-Holdforth, J., & Lake, P. K. (2017). The evidence-based practice competencies related to critical appraisal: Rapid critical appraisal, evaluation, synthesis, and recommendations. In B. M. Melnyk, L. Gallagher-Ford, & E. Fineout-Overholt (Eds.), *Implementing the EBP competencies in healthcare: A practical guide for improving quality, safety, & outcomes* (pp. 87-89). Sigma Theta Tau International
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