P & T Competition: "How to" Session

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Objectives: Developing Your Drug Monograph

- Additional insight in drug evaluation process
- Tips for monograph creation/best practice
- Key areas for emphasis
- Enhancement opportunities



Getting Started







Drug Monograph- Where to begin...





Drug Monograph Development

• EBM Process: Ask, Acquire, Assess, Apply

Key Questions/Scope



Drug Monograph – Areas of Emphasis

- Background Information
- Executive Summary
- Literature Search Method
- Critical Appraisal/Evaluation
- Evidence Synthesis
- Clinical/Cost Effectiveness (Model?)
- Recommendations
- References



Background Information

- Disease Characteristics & Treatment Options
 - Incidence
 - Severity
 - Disease characteristics
 - Treatment options and goals
 - Need for improved treatment options
 - Economic impact

"Grounding your reader"



Executive Summary

- Scope
- Key Questions
- Responses to Key Questions
- Value Proposition
- Recommendations
- Formulary/Non-formulary
- Applicable Utilization Management Criteria
 - Prior Authorization
 - Quantity Limits

Scope/Key Questions

• Scope

- Focus on what is important
- Narrow vs broad
- Defines what your research covers
- Key Questions
 - Population
 - Intervention
 - Comparator (How much better ?)
 - Outcome (Short vs Long term)



Literature Search Method - Results

- Assure reproducibility
- Include trials in your evidence tables
- Document in your references
- Make sure your numbers add up



Literature Search Method - Considerations

- Source (Database, Manual)
- Search Method
 - Published Data
 - UnPublished Data
- Search terms
- Date span covered
- Date conducted
- Exclusion Criteria / Limitations
- Search Results



Literature Search Method – Evidence Hierarchy



Filtered (Published)

Examples of Trusted Sources*

- Cochrane Database of Systematic Reviews
- Agency for Healthcare Research & Quality
- Drug Effectiveness Review Project (DERP)
- Centre for Reviews and Dissemination
- Database of Abstracts of Reviews of Effects
- Canadian Agency for Drugs & Technologies in Health

"Trusted Sources" are generally known for:

- Rigorous, systematic methodology
- Transparency
- Auditing/critical appraisal of included research to base conclusions
- Systematic reviews that hold up to critical appraisal by external users.

Unfiltered (Published & Unpublished) Sources

- PubMed
- Professional Organizations & Societies
- Manufacturer Dossier



Literature Search Method

Formulary Review

10 ACE Inhibitors, **8** Angiotensin Renin Blockers, **1** Direct Renin Blocker *New product – azilsartan*

Total # of Medications: 19 drugs

Search Strategy: ACEI's, ARB's, Direct Renin Blockers

- ✓ PubMed / Medline
 - Type: RCT's, Systematic Reviews, Meta-analyses
 - Timeframe: 1990 March 2011
 - Conditions: Hypertension, Heart disease, Kidney disease
- ✓ Systematic Reviews "Trusted Sources" (i.e. Cochrane, AHRQ, DERP)
- Manufacturer Dossier (eDossier)

Search Results: <u>3000⁺</u> RCT's & Review Citations



Literature Search – Example

Formulary Review ACE Inhibitors, Angiotensin Renin Blockers, Direct Renin Blockers *New product – azilsartan*

Search Results: Over <u>3000</u>⁺ RCTs & Review Citations Step 1: Identify Pertinent High Quality CER Systematic Reviews

1 AHRQ CER Review Hypertension	1 AHRQ CER Review Ischemic Heart Disease	1 DERP/AHRQ CER Review Hypertension, CHD, Left ventricular dysfunction, diabetic nephropathy, non- diabetic kidney disease	2997 ⁺ Citations to review
May '96 – May '06 1185 citations - Excluded 1116 - Included 69	May '96 – Feb '09 1342 citations - Excluded 1287 - Included 57	 1950 – June '09 1328 citations Excluded 1205 Included 123 	

"Systematically Screens & Appraises" Large Body of Literature







Literature Search: Documentation

Search Parameters	Total Results	Met Inclusion Criteria
 Database (Date searched) drug AND disease, etc. Only placebo/active comparator studies Only studies with certain endpoints? Limits: Humans, English. RCT? Excluded: PK trials? Post hoc? Date span for Body of literature 	# trials	RCTs: # trials Systematic Reviews: # trials Meta-analysis: # trials
 Database (Date searched) drug AND disease, etc. Only placebo/active comparator studies Only studies with certain endpoints? Limits: Humans, English. RCT? Excluded: PK trials? Post hoc? Date span for Body of literature 	# trials	RCTs: # trials Systematic Reviews: # trials Meta-analysis: # trials
Other manual search for published/unpublished data. List source and criteria used (i.e. dossier, National Organizations, FDA Docket) Inclusion Criteria Exclusion Criteria	# trials	RCTs: # trials Systematic Reviews: # trials Meta-analysis: # trials
Overall Total (Unique)	# Unique Trials	RCTS: # total Unique Systematic Review: # Total Unique Meta-analysis: # Total Unique

Literature Search - Documentation

Systematic methodology used to identify data for evidence synthesis INCLUSION CRITERIA

Study Type	N
Randomized controlled trials (RCT) ?	
Meta-analyses of RCTs ?	
Systematic reviews ?	
Randomized pragmatic Trials ?	
Prospective cohort studies ?	
Retrospective cohort or case-control studies ?	
Economic modeling studies ?	
Case Series ?	
RCT abstracts, not peer-reviewed ?	
Other abstracts, posters, etc., not peer-reviewed ?	

EXCLUSION CRITERIA

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Other abstracts, posters, etc., not peer-reviewed ?	

Final Results for Critical Appraisal and Evidence Synthesis

Study Type	N
Randomized controlled trials (RCT)	
Meta-analyses of RCTs	
Systematic reviews	
Randomized pragmatic Trials	
Prospective cohort studies	
Retrospective cohort or case-control studies	
Economic modeling studies	
Case Series	
RCT abstracts, not peer-reviewed	
Other abstracts, posters, etc., not peer-reviewed	

- Demonstrate transparency
- Include in evidence tables
- Document in references
- Make sure numbers add up



Critical Appraisal Evaluation Tools

Individual Clinical Trials/Systematic Reviews, Meta-analyses Individual Pharmacoeconomic Studies



Critical Appraisal Evaluation

Evidence Tables – Populating your Evidence Tables

- Reporting study element
- Identifying study strengths/weaknesses
- Critically appraising trials
- Methods for study grades / documenting rationale
 - ICER (High certainty, Moderate certainty, Low certainty)
 - U.S. Preventive Task Force (Good, Fair, Poor)
 - AHRQ (Good, Fair, Poor)
 - Delfini (Useful, Possibly Useful, Uncertain Usefulness, Poor)



Critical Appraisal: Evidence Table-Reporting Elements

- Minimum recommendations for reporting RCTs
- Standard way of reporting clinical trial findings
- Complete/transparent reporting
- Aid in critical appraisal and interpretation



Evidence Tables – Populating Individual Clinical Studies – Identifying Strengths/Weaknesses

CONSORT Flowchart



Helps track all participants through the trial

From Schulz KF, Altman DG, Moher D, for the CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. BMJ 2010;340:c332.

For more information, visit www.consort-statement.org.



www.amcp.org

Reference: www.consort-statement.org

Evidence Tables – Populating

Individual Clinical Studies – Identifying Strengths/Weaknesses

DADED SECTION	Theres	Description	Received
And topic	Item	Description	on Page #
TITLE & ABSTRACT	1	How participants were allocated to interventions (e.g., "random allocation", "randomized", or "randomly assigned").	
INTRODUCTION Background	2	Scientific background and explanation of rationale.	
METHODS Participants	3	Eligibility criteria for participants and the settings and locations	
Interventions	4	Precise details of the interventions intended for each group and	
Objectives	5	Specific objectives and hypotheses	
Outcomes	6	Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements (e.g., multiple observations, training of assessors).	
Sample size	7	How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.	
Randomization Sequence generation	8	Method used to generate the random allocation sequence,	
Randomization Allocation concealment	9	Method used to implement the random allocation sequence (e.g., numbered containers or central telephone), clarifying whether the sequence was conceiled until interventions were assigned	
Randomization	10	Who generated the allocation sequence, who enrolled	
Blinding (masking)	11	Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to group assignment. If done, how the success of blinding was	
Statistical methods	12	evaluated, Statistical methods used to compare groups for primary <u>outcome(s); Methods for additional analyses</u> , such as subgroup analyses and adjusted analyses.	
RESULTS Participant flow	13	Elow of participants through each stage (a diagram is strongly recommended). Specifically, for each group report the numbers of participants randomly assigned, receiving intended treatment, completing the study protocol, and analyzed for the primary outcome. <u>Describe protocol deviations from study as planned</u> , together with reasons.	
Recruitment	14	Dates defining the periods of recruitment and follow-up.	
Baseline data	15	Baseline demographic and clinical characteristics of each group.	
Numbers analyzed	16	Number of participants (denominator) in each group included in each analysis and whether the analysis was by "intention-to- treat". State the results in absolute numbers when feasible (e.g., 10/20, not 50%).	
Outcomes and estimation	17	For each primary and secondary outcome, a summary of results for each group, and the estimated effect size and its precision (e.g., 95% confidence interval).	
Ancillary analyses	18	Address multiplicity by reporting any other analyses performed, including subgroup analyses and adjusted analyses, indicating those pre-specified and those exploratory.	
Adverse events	19	All important adverse events or side effects in each intervention group.	
DISCUSSION	20	Interpretation of the results, taking into account study hypotheses, sources of potential bias or imprecision and the dangers associated with multiplicity of analyses and outcomes.	
Generalizability	21	Generalizability (external validity) of the trial findings.	

- Randomization
- Inclusion/Exclusion Criteria
- Controls
- Washout
- Treatment arms
- Blinding

- \rightarrow .
- Critical Appraisal
 - Study Strengths
 - Study Weaknesses

- Allocation Concealment
- Power
- Intent-to-treat
- Results (primary & secondary endpoints)
- P-values
- Confidence intervals



Evidence Tables – Populating

Critical Appraisal – Common Findings

- Missing details (blinding, randomization, concealment)
- Small studies
- Lack of an intent to treat analysis.
 - Number randomized ≠ Number reported
 - What happened to missing subjects
- Large drop-out
- Endpoints
 - A priori
 - Unvalidated
 - Uncertain clinical relevance or benefit.



www.amcp.org

Delfini White Paper. Missing Data Considerations. Available at <u>www.delfini.org</u>. Accessed October 27,2009.

Evidence Tables - Populating

• Systematic Reviews* - Identifying Strengths/Weaknesses

Elements	Critical Appraisal for Strengths/Weaknesses
Search Strategy	Limited, omitted, outdated time frame
Study Selection	No description of study selection. Critical appraisal performed on included trials.
Quality of Studies Included	Authors base conclusions (such as comparative efficacy statements, hazard ratios, relative risk, etc) on poor quality trials.
Patient Population Assessment	Subjects studied may not be representative of population overall.
Homo-/heterogeneity	If results of the studies were combined, (i.e. meta-analyses), did authors apply tests of homogeneity/heterogeneity to assure that the variation between studies is due to chance?
Data Collection	Did more than one author extract and combine data?
Weighting	If weighting was employed, was a reasonable approach taken (e.g., larger or higher quality studies)?
Transparency	Could this review be replicated?
Other Issues	Potential conflict of interest. Lack of disclosure.
Safety Analysis	Was safety analyzed? How was it pooled?

* The Delfini Group <u>www.delfini.org</u>





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Evidence Synthesis – Choose a Grading Methodology

- Collating body of evidence after critical appraisal
- Evidence Synthesis Methodologies (Examples)
 - Integrated Evidence Rating (ICER)
 - Agency for Healthcare Research and Quality (AHRQ)
 - U.S. Preventive Services Task Force (USPSTF)
 - Delfini
- Apply based on evidence that you critically appraised for strengths/weaknesses
 - High Quality evidence Conclusions are acceptable for use
 - Low Quality evidence Conclusions are generally uncertain
- Demonstrate application, consistency, transparency
 - Evidence Grade
 - Strength of Evidence



Institute for Clinical & Economic Review (ICER)*

High Certainty	D Inferior or Poor value High certainty of inferior health benefit	C Comparable or No added Benefit High certainty of comparable health benefit	B Incremental or Modest Benefit High certainty of small health benefit	A Superior or Great Benefit High certainty of moderate-large net health benefit
Moderate Certainty	Insufficient		U/P Unproven with Potential / Moderate certainty of small or moderate-large net health benefit	
Low Certainty	Insufficient The evidence does not provide high certainty that the net health benefit of the medication is at least comparable to that provided by comparators (or placebo/best supportive care, if no other treatment is available.)		alth benefit comparators vailable.)	
	Negative Health Benefit	Comparable Health Benefit	Incremental Health Benefit	Substantial Health Benefit

*Institute for Clinical and Economic Review: http://www.icer-review.org/index.php/medcare-icer-evidence-rating-682010.html.



U.S. Preventative Task Force*

Level of Certainty	Description of Available Evidence
High Certainty	 Consistent results based on well-designed, well-conducted studies in applicable populations. Able to assess effects on health outcome and quantify the net benefit. Conclusions are unlikely to be strongly affected by results from future studies.
Moderate Certainty	 Sufficient to determine effects on health outcomes; however, confidence in the estimate is limited by factors such as: Number, size or quality of individual studies Inconsistency of findings across studies Limited generalizability Lack of coherence in the chain of evidence As more information evolves, the magnitude or direction of observed effect could change. Change could be large enough to alter the conclusion.
Low Certainty * US Preventive Ser	 Insufficient to assess effects on health outcomes because of: Limited # or size of studies Important flaws in study design or methods Inconsistency across individual studies Gaps in chain of evidence Findings not generalizable to applicable population Lack of information on important health outcomes More information may allow an estimation of effects on health outcomes

Agency for Healthcare Research and Quality*

Grades for Body of Evidence	Definition
High	High Confidence that evidence reflects the true effect. Further research is very unlikely to change our confidence in the estimate of benefit
Moderate	Moderate Confidence that evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate.
Low	Low confidence that the evidence reflects the true effect. Further research is likely to change the confidence in the estimate of effect and is likely to change the estimate
Insufficient	Evidence either is unavailable or does not permit a conclusion

*AHRQ: <u>http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=328</u>.



Evidence Tables – Grading of the Evidence

Delfini™ Validity & Usability Grading Scale

Grade A: Useful

The evidence is strong and appears sufficient to use in making health care decisions; it is both valid & useful.

Grade "High to Low B": Possibly Useful

The evidence is potentially strong and might be sufficient to use in making health care decisions.

- **High B:** Evidence is strong enough to conclude that results are probably valid & useful; however, results from multiple studies are inconsistent, or studies may have some (but not lethal) threats to validity.
- Low B: Evidence might be sufficient to use in making health care decisions; however, there remains sufficient uncertainty that evidence cannot fully reach a high Grade B and uncertainty is not great enough to fully warrant a Grade U.

Grade U: Uncertain

There is sufficient uncertainty so that caution is urged regarding the use of the information in making health care decisions.

- Grade UV: Uncertain Validity perceived methodological weaknesses
- Grade UU: Uncertain Usefulness methodology appropriate but applicability of results uncertain
- Grade UVU: Uncertain Validity and Usefulness combination of the above
- Grade UA: Uncertainty of Author author uncertain about findings

Grade X: Not Useful

Studies are so poorly done and are so potentially misleading that the strongest caution is urged about their quality.



Delfini – Overall Level of Evidence

Classification	Definition
High	Evidence is conclusive that
Moderate	There is sufficient evidence to conclude
Borderline	There is uncertainty due to low quality data that
Inconclusive	There is insufficient evidence to conclude that

Reference: www.delfini.org. Accessed October 27,2009.



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Clinical / Cost Effectiveness



Clinical / Cost Effectiveness

- Quantifying the Benefit Observed
- Clinically relevant magnitude of effect?
 - Based on reliable evidence
 - Quantify the benefit
- Value relative to other options or no treatment
 - Number needed to treat (NNT)
 - Number needed to harm (NNH)
- Generalizability of evidence



- Rarely have gold standard
 - Double blind randomized controlled trial?
 - Specific harms defined in advance?
 - Was trial powered to detect harms?
 - P-values reported between drug and placebo?
- How many subjects were studied?
- How long were the trials?



Good Models - Checklist

Structure

- Is it a disease-progression model with appropriate time horizon?
- Are the treatment pathways relevant to the decision?
- Does it model usual clinical practice?
- Are the mathematics of the model accurate and available for inspection?

Data

- Are the sources of evidence valid?
- Have the data been interpreted and incorporated accurately?
- Have uncertainties in the data been addressed?
- Are linkages between intermediate and long-term outcomes:
 - · Valid?
 - Based on appropriate (trial or retrospective) evidence?

Analysis/Summary

- Are outcomes relevant to decision-making in the health plan?
- Was incremental analyses performed on both health effects and costs?
- Are outcomes verifiable, i.e. traceable back to the inputs and model structure?
- Is uncertainty in the data tested in a reasonable fashion?
- Is the sensitivity analysis displayed via tornado diagram?
- Are results and uncertainty presented in a fashion that facilitates incorporation into formulary monographs and decision-making?



Pharmacoeconomic/Budget Models

Elements	Critical Appraisal
Drugs compared & doses	
Form of economic analysis	
Model Structure (if relevant)	
Time-horizon	and
Perspective of the analysis	Weaknesses
Source for Efficacy & Safety data	
Sources for Utility weights (if relevant)	
Cost-Effectiveness Results	
Sensitivity Analysis	



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Executive Summary - Completion

- Scope Defined
- Key Questions
- Responses to Key Questions
- Value Proposition
- Recommendations
- Applicable Utilization Management Criteria
 - Prior Authorization
 - Quantity Limits



Executive Summary

- Key Questions Response
 - Answer the Question
 - Include statement describing overall quality for body of evidence
 - State/identify where there is evidence gap



Value Proposition



Evidence



Value Proposition - Considerations

Consideration	Description	Definitions
Other Options	Established	- FDA approved for an indication
-	treatment options/	- Standard of practice treatment guidelines, compendia or expert opinion
	Track Record	(professional position statements)
Safety	Proven Safety	Profound, proven safety advantages over established treatment
(safer) ♦	Advantages	- Reliable, comparative safety data (safety= primary endpoint)
, , ,		- "All or none" observational data demonstrating relative absence of serious or
		troublesome adverse effects.
	Track record	Post-marketing data:
		- A minimum one year for acute, serious diseases
		- Three years or more for chronic, preventative therapy
		No serious, unusual safety concerns relative to other options
	Safety concerns are	- Significant adverse effects are known, but identifiable/manageable
	manageable	- Because of the nature of the treatment, patients will be monitored closely so
		potentially under recognized adverse effects may be able to be identified.
	Safety concerns are	- Black Box Warnings
(less safe)	significant and	- Safety signals that risk of harms could potentially outweigh benefits;
▼	may outweigh	- Safety concerns require significantly more monitoring than other available
	benefit	treatment options or may not be readily recognizable even with earnest
		monitoring.
Cost	Costs Prior to Mfr	Average estimated "amount allowed" (actual dollars paid to a pharmacy) for an
	Contracting	average prescription.
	Lowest Overall	Overall actual costs to the plan and members are considered after mfg discounts are
	Total Cost	applied to the medication in question or across a portfolio of drugs.
Disease	Multiple treatment	Complex conditions that are known to often require multiple treatment options
Characteristics	options are needed	based on clinical experience (standard of practice), inter-patient variability,
		recognized quality standards, resistance-patterns, or pharmacogenomics.
	Observable clinical	The impact of therapy is readily observable ("all or none response") and attributable
	benefit	to the medication.
Standard of Care	"Standard of	There is not significant controversy regarding the effectiveness of the treatment.
	Care"	
Impact on Clinical	Remove or reduce	The therapy must be recognized to remove or significantly reduce known barriers to
Burden	clinical barriers to	care.
	treatment	

Recommendations

- Formulary vs Non-Formulary
- Prior Authorization
- Quantity Level Limits
- Timing for next review



References



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Summary

Area of Emphasis	Considerations
Introduction/Background	 Disease state. Pharmacotherapy What do we need to be aware of
Executive Summary	 Key questions and reason for review Scope clearly defined Responses include quality of evidence assesses Recommendations consistent with assessment; Practical
Evidence Tables	 Reporting of important elements Identify key trial strengths/weaknesses Critical appraisal and grading with supportive rationale
Clinical/Cost Effectiveness	 Tables populated Critical appraisal grades/Evidence Synthesis Rationale
Search Methodology	 Documented of complete search strategy Aligns with # of clinical trials assessed & references
Recommendations	 Consistent evidence synthesis & overall value proposition. Utilization management Practical application and rationale for prior authorization; quantity limits

Final Checklist

- Demonstrating Knowledge
- Tone/Objectivity
- Clear, Concise
- Reproducibility
- Grading of evidence (arbitrary or consistent)
- Quality of Evidence
- Practical / Clear responses & recommendations
- References do citations add up



Enhancement Opportunities

Developing Your Drug Monograph

- Pipeline information
 - Medications in the category going generic?
 - New brand medications soon to be approved?
- European data
- Perspectives on real world data
- Utilization management, outside of PA
- Creation of own PE models?



Resources

- Institute for Clinical and Economic Review: <u>http://www.icer-review.org/index.php/medcare-icer-evidence-rating-682010.html</u>
- AHRQ: <u>http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=328</u>.
- US Preventive Services Task Force: <u>http://www.uspreventiveservicestaskforce.org/uspstf/grades.htm</u>
- The CONSORT Group: <u>www.consort-statement.org</u>
- Delfini Group: <u>http://www.delfini.org/</u>
- The Cochrane Collaboration: <u>http://www.cochrane.org/</u>
- Clinical Evidence: <u>http://www.clinicalevidence.com/ceweb/conditions/index</u>
- FDA: <u>www.fda.gov</u>
- European Medicines Agency (EMEA): <u>http://www.emea.eu.int</u>
- Drummond M et al. Methods for the Economic Evaluation of Health Care Programmes (3rd edition). Oxford University Press, NW, USA (2004)

