University of Wyoming
College of Health Sciences
School of Pharmacy

CONTINUING PHARMACY EDUCATION

Accreditation Council for Pharmacy Education

WYOMING CERTIFICATE PROGRAM

A NEW START IN HEALTH TECHNOLOGY ASESSMENT

INTRODUCTION

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PROGRAM OVERVIEW

Welcome to the School of Pharmacy, University of Wyoming 2023/2024 ACPE accredited Certificate Program *A New Start in Health Technology Assessment*. This is a 14-module 18 credit hour program designed to introduce a new paradigm for the evaluation of pharmaceutical products and devices [1],

The focus of this Program is to examine the theoretical and practical foundation for the methods and application of techniques in health technology assessment that meet the standards of normal science and fundamental measurement. This involves meeting the evidence needs of formulary committees, practitioners, patients and other health system decisionmakers is critical for effective health care delivery and the meaningful assessment of pharmaceutical products and devices.

Unfortunately, current analytical standards in pharmacoeconomics or health technology assessment (HTA) fail to meet the required evidentiary standards. The misplaced focus on approximate information, assumption driven simulated modelled claims for cost-effectiveness fails both the standards for normal science and fundamental measurement; it is pseudoscience. In short, the existing assessment framework is an analytical dead-end, we need a new start, a new paradigm, in the assessment of value claims for competing pharmaceutical products and devices; one that is not only consistent with the standards of normal science and fundamental measurement, but one that focuses on capturing needs-fulfillment quality of life of patients and caregivers, with protocol supported value claims that can support outcomes based contracting, together with ongoing disease area and therapeutic class reviews.

The program is in three parts: (i) required evidentiary standards for product and therapy assessment; (ii) the failure of approximate modelled information for therapy decisions; and (iii) value claims and protocols for a new start in product evaluation that meet required scientific standards with feedback for ongoing disease area and therapeutic class reviews. The importance of rejecting non-evaluable value claims for conducting and assessing outcomes research will be emphasized. This rejection provides a firm empirical basis for evaluating long-term clinical and patient reported outcomes (PROs), together with claims for resource allocation and direct medical costs for primary care as well as hospitals and managed care organizations, state and federal agencies.

A NEW START IN HEALTH TECHNOLOGY ASSESSMENT

This proposed new start paradigm aims to reject 30 years of misplaced and wasted effort in HTA. In the early 1990s the decision was made that in order to make the case for new pharmaceutical products at product launch; hypothesis testing was to be abandoned in favor of creating assumption driven modeled approximate information to support formulary decisions [2]. This was uncritically accepted by leaders in the field and detailed in textbooks and practice guidelines. It was also uncritically accepted by academic centers, government agencies and analysts despite warnings to the contrary. The result was the acceptance for publication of thousands of cost-per-QALY imaginary claims which completely failed to meet any semblance of the standards of normal science; hence to term “pseudoscience”. We are still locked into this analog of intelligent design with the recent publication of the CHEERS 2022 guidance for submitting imaginary modeled

claims to academic journals, to reinforce the leading textbook on constructing imaginary modeled claims for cost effectiveness applying techniques such as probabilistic sensitivity analysis [3] [4] .

The new start paradigm provides a theoretical and practical foundation for the appropriate methods and application of techniques in HTA that meet the standards of normal science and fundamental measurement. Meeting the evidence needs, including outcomes contracting, of formulary committees, practitioners, patients and other health system decisionmakers, including minimizing bias, is critical for effective health care delivery and the meaningful assessment of pharmaceutical products and devices [5]. Unfortunately, current analytical standards in pharmacoeconomics or HTA fail to meet the required evidentiary standards. The Certificate Program proposes a new start in HTA to meet the needs of health system decision makers; a framework of analysis that is not only consistent with the standards of normal science and fundamental measurement, but one that focuses on capturing needs-fulfillment quality of life of patients and caregivers. The importance of rejecting non-evaluable value claims for conducting and assessing outcomes research will be emphasized. This rejection provides a firm empirical basis for evaluating long-term clinical, quality of life and resource utilization outcomes, including engaging with health systems to identify and even contract for key value claims as part of disease ara and therapeutic class reviews.

These modules present the case that the existing approach to HTA or pharmacoeconomics is an analytical dead end. More to the point: we have wasted some 30 years in advocating the creation of value claims that lack any scientific credibility. The reason is quite straightforward: The International Society for Pharmacoeconomics and Outcomes Research (ISPOR), the Institute for Clinical and Economic Review (ICER) and academic groups, following leaders in the field, have rejected the standards of normal science: the requirements that all value claims for response to therapy have to expressed as single attributes that are credible, evaluable and replicable [6].

Instead, the focus has been on assumption driven simulated claims that fail the demarcation test between science and non-science' they are pseudoscience [7]. The assumption driven simulated modeled claims proposed in HTA create invented claims the cost-effectiveness of competing therapies; a failed methodology. They fail not only because they reject the standards of the physical sciences and the more advance social sciences, but because the entire modeling framework is a logical and mathematical impossibility. If we are to provide a framework to establish the relative worth and impact of competing therapies, then the current methodology of invented outcomes and blanket modeled cost-effectiveness claims must be rejected. We need a new start in technology assessment that is meaningful to health system decision makers and which is not metaphysics or pseudoscience, but an analytical framework consistent with the standards of normal science with robust and evaluable value claims.

Practitioners are aware of the manifest deficiencies in modelled claims [8]. Yet they persevere, as shown by the recently released CHEERS 2022 guidance for construction and submission of imaginary value claims for competing products to leading journals; who have in turn endorsed the CHEERS 2022 methodology [1]. The belief is that formulary committees are prepared to accept imaginary claims to support pricing and access decisions. The problem, is that by changing assumptions any number of competing modeled claims can be presented. A recent analysis of industry versus non-industry model claims has pointed to the presence of a significant systematic bias that favors claims sponsored by industry; modeled claims have been designed to create a

required outcome to support sponsor pricing [9]. At the same time, journal editors are presumably more than happy to publish any number of simulated imaginary claims, driven by assumptions, which have no relation to reality for an impossible unknown future.

It is not often appreciated, but the current analytical framework supports a belief system in imaginary value claims that is unique in the physical and social sciences; rejecting the standards for the discovery of new, yet provisional facts, that has been accepted for over 300 years [10]. While practitioners in HTA or pharmacoeconomics claim it is a branch of economics, this is wishful thinking. It is totally at variance with the standards of analysis both in mainstream economics and in the applied discipline of health economics, the study of the production and consumption of health and healthcare; practitioners' confuse the 'standards' of non-science with those of science.

HTA practitioners are devoted to a belief system which has more in common with that prevailing in the middle-ages; one beginning only to be overthrown with the scientific revolution of the 17th century by figures such as Bacon, Galileo, Descartes and Newton. In this context it is worth remembering the motto of the Royal Society (founded in 1660): *nullius in verba* (take nobody's word for it). This is rejected in HTA by asking, with assumption driven claims, that we take anybody's word for it [11]. Any non-empirically evaluable claim is as good (or bad) as any other.

It is worth quoting Richard Dawkins, the evolutionary biologist, on differentiating science from non-science (or simply faith in creating non-evaluable approximate information value claims):

> *.....the selective forces that scrutinize scientific ideas are not arbitrary or capricious. They are exacting well-honed rules and they do not favor self-serving behavior. They favor all the virtues laid out in textbooks of standard methodology: testability, evidential support, precision, quantification, consistency, intersubjectivity, repeatability, progressiveness, independence of cultural milieu and so on* [12].

Measurement is critical if value claims for competing products are to have any credibility. If the tools used to support claims for measuring response are irrelevant, failing to meet required measurement standards, then we have to question almost all direct and indirect generic preference scores and the overwhelming majority of patient reported (PRO) instruments. They all fail the axioms of fundamental measurement.

At the same time, value claims must be disease specific tailored to specific attributes relevant to formulary decisions whether these are for clinical claims, quality of life claims or drug and resource utilization claims. The target must be to develop instruments that meet ratio or interval measurement properties. Blanket claims for comparative cost-effectiveness are totally unacceptable.

In short, as will be explored, a new start in HTA rests on two premises:

(1) All value claims for a product or therapeutic intervention must refer to single unidimensional attributes that meet the demarcation standards for normal science: all value claims must be credible, evaluable and replicable in a meaningful timeframe; and

(2) All value claims must be consistent with the limitations imposed by the axioms of fundamental measurement: they must meet interval or ratio measurement standards

It is no exaggeration to make the case that in HTA a failure to recognize these premises means has been counterproductive, although no leader in this field, principally academic, will admit to this wasted effort. After all, to base one's professional career on a series of false assumptions, and demonstrated lack of awareness of the standards of normal science, in particular fundamental measurement, is a failure few would care to acknowledge. If we add to this the extent to which literally thousands of students and analysts have followed this lead makes an admission all the more damaging. There are now thousands of publications generating mathematically impossible quality adjusted life years (QALY) models, none of which have any scientific credibility [13] [14].

It is not so much that HTA is at the crossroads; the decision to take the wrong road was made decades ago. No, we must seriously question the pharmacoeconomic belief system (or meme). This will be defended; the wagons will be pulled into a circle. There is no option: we require a paradigm that makes analytical sense and which brings us back to the standards we have long ignored. This is the purpose of this ACPE certificate program

LEARNING OUTCOMES AND GOALS

- Leverage the strengths and weaknesses of health technology assessment techniques as defined by pharmacoeconomics in terms of the standards for normal science and fundamental measurement
- Understand the importance of a new framework for economic evaluations in formulary decision making
- Identify the appropriate measurement constructs for value claims in therapy impact
- Identify the appropriate health technology assessment framework for a given situation
- Differentiate the options in economic analysis for value claims
- Recognize the limitations of simulation modeling in creating value claims
- Recognize the limitations of QALYS and patient reported outcomes (PRO) claims
- Construct appropriate resource utilization and cost claims
- Leverage practice competencies related to the importance of the patient (or caregiver) voice in value claims
- Critically assess value claims for competing therapies
- Provide a framework for values claims outcome contracting

READING AND REFERENCE MATERIALS

There is no textbook for this course as there is none that meets the required standards for health technology evaluation. Instead, the course is built around a series of 14 modules with slides/audio presentation supported by extensive notes and references. Existing textbooks are out of date in terms of the appropriate analytical framework and techniques for health technology assessment and supporting products over their lifetime. The references have been selected because they

support the arguments presented in the modules to support a new start in the techniques of health technology assessment and formulary submissions.

PRE-COURSE READING

Before beginning this program please read the following key references:

Langley PC and McKenna SP. Measurement, modeling and QALYs [version 1; peer review: 2 approved] *F1000Research* 2020, 9:1048 https://doi.org/10.12688/f1000research.25039.1

Langley P. Nothing to Cheer About: Endorsing Imaginary Economic Evaluations and Value Claims with CHEERS 22 [version 1; peer review: 2 approved]. *F1000Research* 2022, 11:248 (https://doi.org/10.12688/f1000research.109389.1)

Langley P. Facilitating bias in cost-effectiveness analysis: CHEERS 2022 and the creation of assumption-driven imaginary value claims in health technology assessment [version 1; peer review: awaiting peer review]. *F1000Research* 2022, 11:993 (https://doi.org/10.12688/f1000research.123709.1)

COURSE MODULES

The program comprises an Introduction and 14 teaching modules grouped into three categories, each module supported by notes, links to key references, a slide presentation with audio commentary and an assessment (modules 1 – 12).

(i) Meeting standards for normal science (4 modules)
(ii) The failure of approximate information (5 modules)
(iii) A new paradigm in health technology assessment (5 modules)

- Four modules that make the case for the standards of normal science and the rejection of pseudoscience:
    - Science versus non-science*: Understanding the importance of demarcation in the acceptance of value claims*
    - Ratio and interval measures: *Appreciating the importance of interval and ratio measures to support value claims*
    - Assumptions and Hume's problem of induction; *Understanding that assumptions cannot be used to validate modeled value claims*
    - CHEERS 22: Tenacity of false belief systems in pharmacoeconomics: *Consider the potential benefits given the limitation of CHEERS 2022 guidance*

- Five modules that address the failure of created approximate information:
    - Truth is not consensus: *Consider whether there is any justification for lifetime modeled claims in formulary decisions*

    - Failure of multiattribute generic preference measures: *Understand the case for rejecting multiattribute preference measures in value claims for therapies*
    - The impossible QALY: *Understand why., despite its acceptance, why the QALY based on ordinal scores must be rejected*
    - Impossible value claims: *Consider the case for single attribute ratio value claims in formulary submissions*
    - Abandoning models in value claims: *Consider the circumstances under which modeled vale claims are acceptable*

- Five modules that detail the standards for a new start in formulary submissions:
    - Guidelines for value claims in formulary submissions: *Introducing a proposed format for therapy value claims that meet required evidentiary standards*
    - The patient voice: need fulfillment quality of life: *Introducing the needs-fulfillment quality of life measure for patients and caregivers*
    - Selecting PRO claims: *Introducing criteria for evaluating measurement standards for PRO claims*
    - Formulary submission guidelines: *Proposal for a formulary submission package for value claims and protocols*
    - Questions a formulary committee should ask; *Questions to address to ensure value claims meet standards of normal science and fundamental measurement*

METHODS AND CONTINUING EDUCATION REQUIREMENTS

This program as detailed above covers an introduction and 14 modules which include recorded lectures matched to, slides for each module, notes supporting each module and reading material. Modules 1 – 14 require completion of a 10-item true/false assessment where participants must attain a score of 70% (it can be retaken). Modules 13 and 14 require participants to respond to a series of 20 statement (agree/unsure/disagree) taken from a draft formulary submission guideline. This is not scored; it must be completed

All evaluations must be completed by the expiration date of the program for each participant. Evaluations that are not received by this time will not be honored and the participant will not receive credit. Certificate Program completion credit will be assigned for the year in which the program is successfully completed.

CE credits awarded will be electronically uploaded to the CPE Monitor system within 4 weeks of the UW SOP continuing education group receiving fully completed assessments and evaluation forms.

FACULTY DISCLOSURE

As a provider accredited by ACPE, it is the policy of the University of Wyoming, School of Pharmacy continuing education group to ensure balance, independence, integrity, objectivity, and scientific rigor in all educational activities. A potential for bias may exist if a continuing education faculty member is affiliated with or has a financial interest in any ineligible organization(s) that may have a direct interest in the subject matter of the presentation or the selling, marketing, or

distribution of products discussed in the presentation. Situations involving potential bias are not inherently problematic or unethical, but the prospective audience must be made aware of the affiliation or financial interest. It is intended that any potential bias be identified openly so that the audience is provided full disclosure of the facts and may form their own judgments about the continuing education activity content.

The program has been developed and is presented by Dr Paul C. Langley, Ph.D., Adjunct Professor, College of Pharmacy, University of Minnesota, Minneapolis MN and Adjunct Faculty, School of Pharmacy, College of Health Sciences, University of Wyoming, Laramie WY. Dr Langley is also Director of Maimon Research LLC, a consulting company based in Tucson, AZ.

PRIVACY POLICY

Once you register for a program, your personal information is collected. However, this information is utilized for record-keeping purposes associated with verifying your participation in CE programs in accordance with our accreditation requirements. In addition, this information is used for marketing of other University of Wyoming CE programs. Under no circumstances is your personal information shared with/sold to any other party. You can opt out of receipt of any of our advanced program information at any time.

FURTHER INFORMATION AND PROGRAM COORDINATOR

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REFERENCES (KEY REFERENCES **)

[1] Langley P. Nothing to Cheer About: Endorsing Imaginary Economic Evaluations and Value Claims with CHEERS 22 [version 1; peer review: 2 approved]. *F1000Research* 2022, 11:248 (https://doi.org/10.12688/f1000research.109389.1)

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[14] Langley P. The Great I-QALY Disaster. *InovPharm*. 2020; 11(3): No. 7 https://pubs.lib.umn.edu/index.php/innovations/article/view/3798/2697