UCONN

AN ONGOING CE PROGRAM
of the University of Connecticut
School of Pharmacy

EDUCATIONAL OBJECTIVES

After completing the continuing education activity, learners will be able to

- Define common pharmacoeconomic terms used for economic evaluations.
- Recall the advantages of pharmacoeconomic analysis for formulary management.
- Compare and contrast different types of pharmacoeconomic analyses.
- List the pharmacoeconomic tools a pharmacy benefit manager uses to lower drug costs.

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Pharmacists and pharmacy technicians are eligible to participate in this application-based activity and will receive up to 0.2 CEU (2 contact hours) for completing the activity, passing the post-test with a grade of 70% or better, and completing an online evaluation. Statements of credit are available via the CPE Monitor online system and your participation will be recorded with CPE Monitor within 72 hours of submission

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You Asked for It! CE

Are You Curious about Pharmacoeconomics?

TARGET AUDIENCE: Pharmacists and pharmacy technicians interested in formulary management and cost calculations related to medication and related studies.

ABSTRACT: Many pharmacy practitioners have heard of pharmacoeconomics, but don't have a clear understanding of what that term means. This field of study has a unique vocabulary associated with it and compares different aspects of drugs to determine which drug will produce the best clinical and economic outcomes. Many Pharmacy and Therapeutics Committees are now requiring pharmacoeconomic analysis when they consider formulary changes, but these analysis come in several different forms. Depending on the type and quantity of information available, people preparing reports for Pharmacy and Therapeutics Committee meetings will need to decide which model or studies to use. The foundation for several of the models is quality adjusted life years or QALYs, which have advantages and limitations. Pharmacy benefit managers use cost control tools and pharmacoeconomic analysis to control costs. Some tools that they may use are negotiated price, generic substitution, rebates, and patient copayments. Not all pharmacoeconomic studies are perfect, and this continuing education activity points out some of the ways in which they may be flawed.

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FACULTY DISCLOSURE: The faculty has no financial relationships with an ineligible company.

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INTRODUCTION

Let's start with an old joke. An economics student once asked her professor how much his shoes cost. The professor responded with "I don't know, I haven't finished wearing them yet." Drugs are just like shoes because their sticker price does not reflect their true cost or value.

PHARMACOECONOMICS BACKGROUND

The term pharmacoeconomics dates back to 1986.[1] Dr. Raymond Townsend used the term in a presentation for pharmacists in Canada.[2] Dr. Townsend earned his PharmD at the University of California, San Francisco and developed the pharmacoeconomic research department at the Upjohn Company.[3] The Upjohn team developed pharmacoeconomics to address payment concerns as the healthcare system transitioned from a cash-based system to a third-party payer system. Its goal was to ensure drug spending was efficient and effective.[4] Pharmacoeconomics has evolved over the ensuing 30-plus years to become a subbranch of economics.

Pharmacoeconomics compares different aspects of drugs to determine which drug will produce the best clinical and economic outcomes.[1] Pharmacists who work for pharmacy benefits managers (PBMs) or prepare for Pharmacy and Therapeutics (P&T) committee meetings are most likely to use pharmacoeconomic tools. But all healthcare personnel should understand pharmacoeconomics so they can use these tools as part of their efforts to optimize patient care or explain how health systems select medications to include on a formulary.

While these tools are useful, many pharmacists will avoid using pharmacoeconomics. In preparing to write this continuing education (CE) activity, we asked faculty from two Schools of Pharmacy to identify pharmacoeconomic studies that have had significant clinical impact. One university pharmacy professor said, "Most pharmacoeconomics studies are ignored in clinical practice because practitioners don't understand them or use other reasons to select a drug." This CEn activity should address both of those barriers—lack of understanding and the other considerations when selecting drugs.

MEET GEORGE

In this CE, George will join you. George just graduated from pharmacy school. He was hired at Man with the Yellow Hat Hospital and was put in charge of a presentation for the P&T Committee meeting. George is tasked with presenting a proposal to add a new drug, Monkeydex, to the formulary. If the Committee adds Monkeydex, he also needs to make a recommendation about the similar drug that is already on the formulary, Curiosan: should it remain on the formulary or be removed? The U.S. Food and Drug Administration (FDA) has approved both drugs for adventure-induced curiosity overload (AICO). Ted, another pharmacist, suggested George use pharmacoeconomic tools to analyze each drug's effectiveness and cost.

PAUSE AND PONDER: Before reading further, write down as many pharmacoeconomic terms as you can!

Common Pharmacoeconomic Terms

George figured that common pharmacoeconomic terms are the best spot to begin his learning. George found these terms most helpful[5,6]:

- Comparators: the interventions being compared (and it's possible to have two or more comparators)
- Costs
  - ❑ Direct costs: paid by the health system (salary costs, drug acquisition costs)
  - ❑ Indirect costs: experienced by the patient (including decreased productivity, loss of earnings, hospital travel costs)
  - ❑ Intangible costs: costs of patient/family's feelings (worry, distress)
- Economic evaluation: comparing two different interventions and assessing their costs and outcomes
- Opportunity cost: the loss of benefit from the option not chosen; for example, if you decide to spend two hours on a Friday night paying bills, the opportunity cost is that you cannot spend two hours pursuing leisure activities
- Outcomes: the expected results from an intervention
- Perspective: the different viewpoint from which an intervention can be assessed (patient, provider, payor, or just a population in general)
- Target population: the group of patients who will benefit from the intervention
- Willingness to pay: the maximum amount an individual, a system, an organization, or a payer will pay for an intervention

George compared the two interventions (Curiosan vs. Monkeydex) in **Table 1** (next page). George used the new terms he learned.

PAUSE AND PONDER: Why is it necessary for a health system to consider indirect and intangible costs when entertaining the possibility of adding a medication to the formulary?

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Table 1. George's Use of Pharmacoeconomic Terms to Compare Two Interventions

Term	Intervention Comparison
Economic Evaluation	George will compare Curiosan vs. Monkeydex with the terms provided below
Target Population	Curiosan: Treatment of AICO Monkeydex: Treatment of AICO
Comparators	Curiosan and Monkeydex
Opportunity Cost	The hospital won't be able to benefit from the drug not chosen
Outcomes	Curiosan Pivotal Trial - Participants: 400 Patients aged 18-40 with AICO - Endpoints: reduction of AICO events per year - Results: patients experienced a 55% reduction in AICO events over a year. - Adverse Effects: 15% of patients reported minor adverse effects from the drug such as nausea, infusion site pain, and light headedness Monkeydex Pivotal Trial - Participants: 650 Patients aged 25-45 with AICO - Endpoints: reduction of AICO events per year - Results: patients experienced a 45% reduction in AICO events over a year - Adverse Effects: 20% of patients reported minor adverse effects such as headaches, constipation, and mild weight gain
Willingness to Pay	The hospital is willing to pay up to $4500 for either medication
Perspective	Each intervention will be assessed from the hospital's viewpoint
Direct Costs	Curiosan (TOTAL - $3900) - Administration: infusion once a month for six months ($400/month) plus each infusion costs $100 in medical service fees - Monitoring: monthly blood tests ($100) - Adverse Effect Treatment: requires OTC products ($50/month) Monkeydex (TOTAL - $4200) - Administration: oral tablet taken once daily for twelve months ($300/month) - Monitoring: monthly blood tests ($25) - Adverse Effect Treatment: requires OTC products ($25/month)
Indirect Costs	Curiosan - Patients may lose productivity time due to travel to the infusion center and medication administration times (~2-3 hour/day) - Transportation costs for gas (~$10 each visit) Monkeydex - Patients may lose productivity time due to adverse effects of drug interrupting the day (~1 hour/day) - Hospital offers free mail deliver for Monkeydex
Intangible Costs	Curiosan - Patients may feel stressed about injections and possible adverse effects - Monthly infusions can take a toll on a patient's life and having to take off work for monthly injections can be stressful - After six months the patient will be cured Monkeydex - Patients may feel calmer when taking a tablet - Patient receives the medication monthly and does not need to make any appointments - Patient needs to be on the medication for one year and they will be cured

ABBREVIATIONS: AICO = Adventure-Induced Curiosity Overload

ADVANTAGE OF PHARMACOECONOMIC TOOLS FOR FORMULARY DECISIONS

George learned a ton of new pharmacoeconomic terms and understands how they will be useful for his presentation on Curiosan and Monkeydex. George's curiosity about formularies and the advantages of pharmacoeconomic information prompted him to look for additional material.

What is a formulary?

A drug formulary is a continuously updated list of safe and effective medications approved by a healthcare institution or insurer. The P&T committee is responsible for adding, keeping, or removing medications from the formulary. Although the P&T committee deals heavily with issues related to medications, it has representation from many departments: administrative people, nurses, pharmacists, physicians, and others. The broad membership reflects the fact that medication use is a transdisciplinary function. The P&T committee meets regularly to discuss new FDA drug approvals, revised and updated guidelines, firsthand patient drug experiences, institution policy, and new clinical trials.[7] (See the **SIDEBAR** to the right).

Most formularies are based on a tiered system. A medication's tier in the formulary reflects the plan's coverage. Generic medications usually have a preferred tier and lower out of pocket costs, while brand name medications would be placed on a higher tier unless the PBM, healthcare system, or payor has negotiated a better price for a specific product (discussed below). Two types of formularies exist[7]:

- Open Formulary – the plan provides coverage for all medications, even if they are not on the formulary. Certain medication classes, such as over-the-counter medications, are not covered.
- Closed Formulary – the plan covers only medications that are on the formulary. Non-formulary medications may be covered when a healthcare practitioner deems it necessary, but the prescriber may need to submit a nonformulary drug request or paperwork for prior authorization. Typically, hospitals operate with a closed formulary.

Decision Analysis in Formulary Management

Pharmacoeconomics employs decision analysis to pool data related to medication to determine if one medication is more cost effective than a comparator. It's easy to determine if a drug costs less than another based sheerly on acquisition price. But it can be a challenge to determine if a more or less expensive drug is a better, more effective choice.[9] It is important to note that a drug's effectiveness refers to how it performs in the real world. A drug's effectiveness differs from its efficacy, which reflects how well a drug performs in clinical trials. Once the trials are over, drugs rarely perform as well in the real world where people who take the drug don't receive that same support and may have characteristics that study participants did not have.[10] Pharmacoeconomic researchers take into account a multitude of factors including cost, outcomes, and adverse events when analyzing two comparators.[9]

Many people, like the professor quoted at the start of this CE, wonder if pharmacoeconomics is useful. To highlight the effectiveness of decision analysis in the pharmacy profession, the University of Cincinnati James L. Winkle School of Pharmacy added a collaborative decision analysis project to its curriculum.[11] Its purpose was for students to evaluate a drug based on multiple factors, not just cost. Students used a decision analysis model in Microsoft Excel to compare two antibiotics, using the model to recommend the better option. Professors released a student survey at the end of the project. The survey found that more than 90% of students felt the project was useful and said it widened their thinking skills about what a drug's cost involves. Sticker price is not the only consideration.[11]

While decision analysis incorporates a medication's cost and clinical outcomes, some organizations take a different approach, eschewing pharmacoeconomics entirely. The United States Preventive Services Task Force (USPSTF) makes education-based medication recommendations.[12] It does not consider a medication's cost at all when it makes a recommendation for its use. The USPSTF made this decision to focus solely on a medication's clinical effectiveness because it does not want to limit a patient's healthcare options based on cost.[12]

Overall, pharmacoeconomic analysis offers tools for formulary management including enhanced decision making, cost savings,

SIDEBAR: P&T Committee Duties[8]

- Manage the formulary including any changes and the addition of new drugs
  - ❑ Evaluate any candidate for the formulary using current evidence and clinical studies to either support or refute a drug's addition
  - ❑ Conduct periodic drug use evaluation for all classes of medication
- Consider patient safety in all decision processes
- Ensure the electronic health record (EHR) integrates strategies to support drug selection
  - ❑ Specifically, the EHR should help with dosing and monitoring of patients to prevent errors
- Develop strategies during drug shortages. The P&T committee finds bioequivalent drugs and decides how to ration the available drugs
- Implement medication use policies. Medication use policies guide the use of a medication through prescriber education, pharmacist communication, or team rounds/meetings
- Understand the reimbursement process for health systems concerning which insurances will pay for medications

and overcoming barriers. Using pharmacoeconomic analyses in formulary decision-making evaluates changes comprehensively and helps select the best intervention.[9] Additionally, decision makers can select a more informed approach to keep a drug on a formulary by analyzing a drug's effects in addition to its cost. Last, by using pharmacoeconomic tools more often, it can become more mainstream in formulary decision making.[9]

PAUSE AND PONDER: What drugs or drug classes used in your pharmacy would benefit from pharmacoeconomic analysis?

Common Types of Pharmacoeconomic Analyses

George learned a considerable amount of new information about decision analysis. He sees his error in only considering these medications' acquisition prices in the past. George was curious about the methods pharmacoeconomic professionals use in their studies to report a medication's overall effectiveness. He decided to look at the types of analyses.

The four types of analysis in pharmacoeconomic studies are cost benefit analysis (CBA), cost effectiveness analysis (CEA), cost minimization analysis (CMA), and cost utility analysis (CUA). **Table 2** (below) provides more information about each type of analysis.[6]

George acquired a great basic knowledge of the analyses. He was curious to learn more about some new concepts he found in his research. Specifically, he wanted to know more about calculating outcomes costs for interventions, incremental cost-effectiveness ratio calculations, and how to determine quality-adjusted life years (QALYs). As a basis to understand the different analyses, it's critical to look at QALY first.

Health economists calculate quantity of and quality of years, which are combined into QALYs.[13] To calculate a QALY, begin with the utility score, which is scaled from 0 to 1. A chronic condition may have a utility score of 0.6. The Health Utilities Index Mark 3 (HUI3) is used to measure utility scores. The HUI3 asks a serious of questions about eight attributes (e.g., ambulation, cognition, dexterity, emotion, hearing, pain, speech, vision) and combines them into a score that ranges from 0 to 1. The numeral 1 means perfect health and 0 represents death.[14] To calculate QALY, the utility score is multiplied by the time spent in each state, which translates into the number of years of life the typical patient gains on a treatment. For example, consider patients with a chronic condition (utility score of 0.6) receiving a treatment that will add seven years to their life. To calculate the QALY, multiply 0.6 x 7, which equals 4.2 QALYs gained.[15]

While QALYs can effectively determine how many life years are gained in many situations, they have some downsides.[16] QALYs are blind to health conditions and personal characteristics such as age, disease severity, residence location, and sex. Additionally, the QALY does not encompass all aspects of an intervention's benefit. For example, if a single mother takes a medication that rapidly improves her health, it can also improve the health of her kids and allow her to return to work quicker.[16]

Cost Benefit Analysis. The main purpose is to compare interventions with different outcomes. Typically, a CBA involves adding all the costs of an intervention and subtracting that figure from the

Table 2. Overview of Different Analyses[6]

	CBA	CEA	CMA	CUA
Purpose	-Calculates the cost benefit of an intervention -Both the intervention and its benefits are converted to monetary values	Measures the health benefit in natural units (ex. ulcers healed) and monetary units	-Focuses only on costs to a health service -Used when two interventions have an identical benefit	-Interventions compared based on their impact on a patient's life -Measured in QALYs
Advantages	Helps to compare the costs of different interventions in completely different therapeutic areas	Compares two or more different drugs with similar outcomes, but different success rates	Great tool to use when comparing a generic drug with its brand name counterpart	Outcomes do not need to be measured on a monetary scale
Disadvantages	May ignore benefits that cannot be measured by money value (ex. anxiety relief)	Cannot compare drugs that treat different conditions	Both interventions need to have identical benefits, besides cost	Measurements in QALYs may differ in different disease states

ABBREVIATIONS: CBA = cost benefit analysis; CEA = cost effectiveness analysis; CMA = cost minimization analysis ; CUA = cost utility analysis; QALYs = Quality Adjusted Life Years

expected benefits of the intervention. A CBA helps an organization to see an intervention's return on investment. When doing a CBA, it's important to identify an intervention's direct, indirect, and intangible costs to compare against the intervention's benefits.[17] George found this explanation straightforward but had to ask Ted how he would estimate the expected benefits. To calculate the expected benefits, Ted told George to list the indirect and intangible benefits of the interventions and make educated guesses about monetary values for each, looking first to see if any studies have assigned or estimated costs. George can then subtract the intervention's costs from these expected benefits to equal the net benefits.[18]

Cost Effectiveness Analysis compares the cost and outcomes for two or more interventions for the same condition. A CEA is centered around the incremental cost-effectiveness ratio (ICER). This explanation had George scratching his head, and he had to review it several times to really understand it. The ICER is the ratio of cost differences to outcomes differences between interventions.[19] The ICER is useful because it shows the added cost per unit of health outcome gained from a new intervention.[19] The ICER is calculated using the equation ICER = $costs_1$ - $costs_2$ divided by $effect_1$ minus $effect_2$**.** For example, if intervention 1 costs $200 with an 8 QALY benefit and intervention 2 costs $100 with a 4 QALY benefit. Plug these numbers into into the equation and the ICER = 25. This means $25 per QALY for intervention 1 over intervention 2.[20]

Cost Minimization Analysis considers only half of an economic evaluation because it does not consider the outcomes of interventions. It simply looks at cost. For a CMA to be considered a full evaluation, health economists would need to consider the outcomes of interventions, such as how many life years are saved. If the interventions' outcomes are equal, then the CMA can be useful.[21]

Cost utility analysis helps compare costs and benefits from different interventions. CUA takes into account benefits in terms of how many years are saved and quality of life.[13] CUA is helpful to quantify how much an intervention can extend and improve someone's life. QALYs are used in a CUA to display quality and quantity of years saved for a patient's life. The best time to use a CUA is when someone wants to determine the cost-effectiveness of a product that is a high cost for the payer. A CUA study plans to show where resources should be allocated for maximum health benefit.[13]

George decided to put together his own CEA after learning more about the pharmacoeconomic analyses. He chose this approach since he was able to acquire the most information about how to properly perform a CEA. **Table 3** (below) shows George's CEA for Curiosan compared with Monkeydex.

George analyzed both costs and outcomes from the two interventions. He concluded $100 from each AICO episode was saved by using Curiosan over Monkeydex. The CEA shows Curiosan's effectiveness over Monkeydex when considering costs and outcomes. Let's re-examine the pharmacy professor's quote in which he said, "Most pharmacoeconomic studies are ignored in clinical practice because practitioners don't understand them or use other reasons to select a drug to use." What factors is he referring to? One other factor might be patient volume. This hospital generally sees about five AICO patients per day and they are treated in the emergency department. The P&T Committee knows that Man with the Yellow Hat Hospital has an emergency department with 20 available beds that can usually accommodate all these patients. If the emergency room experiences overflow, hospital management has designated the adjacent hallway to hold up to five excess patients. If the hospital only had a total of five beds available, however, or it was having difficulty staffing the ED, the P&T committee's deliberations might be different.

PHARMACOECONOMIC TOOLS IN PHARMACY BENEFIT MANAGEMENT

George checked the major dailies—the most reliable newspapers across the country that fact-check before they publish—to see if any recent articles talked about the impact of pharmacoeconomics while doing his research. George checked these publications because he wanted to identify any recent major developments in

Table 3. CEA for Curiosan and Monkeydex

	Curiosan	Monkeydex
Total Cost (Both direct and indirect/intangible)	$3900 (direct costs) + $200 (indirect/intangible costs)	$4200 (direct costs) + $100 (indirect/intangible costs)
Effect (Reduction in Curiosity Overload Events per Year)	3 events prevented	5 events prevented
ICER $ICER = \frac{costs_1 - costs_2}{effect_1 - effect_2}$	($4100 - $4300) / (3 - 5)	
Outcome of ICER	$100 from each episode prevented by using Curiosan over Monkeydex	

ABBREVIATIONS: ICER = Incremental Cost-Effectiveness Ratio

the healthcare industry. He found multiple feature articles and opinion pieces on the function of PBMs. George read that PBMs contribute to formulary decision making for payors or employers and use different pharmacoeconomic tools to support their choices. George wanted to find out more about the PBM's role and how they contribute to the formulary, so he delved into the topic again.

PBM History

PBMs surfaced in the 1950s due to a demand for special management of drug benefits.[22] Pharmacists started the first PBMs, founding Prescription Services, Inc in Canada in 1958 and PAID Prescriptions in the United States (U,S.) in 1965. Through the years, health systems and payors began to collaborate with PBMs more often and they grew in size and scope. Now, PBMs handle a wide variety of tasks including formulary maintenance, pharmacy networks, mail order pharmacy operations, and contracts with wholesalers and manufacturers. A PBM's most important service is maintaining a drug formulary. Most PBMs will handle multiple formularies for different clients. PBMs cover certain drugs on a formulary and some drugs require patients to pay a portion of the costs.[22]

George learned from his reading of current events that the Federal Trade Commission (FTC) is looking into PBMs and considering preventing them from combining. [22] The FTC often refers to PBMs as the prescription drug middleman industry and has launched inquiries into their operations and practices.[23] It theorizes that if PBMs continue to combine and integrate, they could possibly have unprecedented control over drug prices, blocking competition. Their concern of market concentration is based on the oligopoly theory which states that if five firms in an industry account for more than 60% of the market, competition is stifled. The FTC alleges that the three largest PBMs processed almost 80% of prescriptions dispensed by U.S. pharmacies in 2023, and the top six processed more than 90%. Describing PBM operations as opaque, the FTC reported in July 2024 that despite their efforts to obtain records from six PBMs, several have refused to comply. A significant concern is that the current PBM structure may disadvantage small pharmacies that are not in the PBM network and the patients they serve.[23,24] The FTC's efforts are focused on promoting fair competition and protecting consumers from high medication prices.[25]

PAUSE AND PONDER: What are some cost control tools used lower drug costs in your pharmacy?

PBM Cost Control Tools

PBMs use an assortment of cost control tools to control costs[26,27,28]:

- Negotiated prices. PBMs work on securing a specific price for drugs. PBMs that purchase drugs at a high volume can negotiate discounted prices. The price paid by the PBM is often much lower than other plans' prices, such as Medicaid. PBMs will apply this discount to the pharmacies in its network, guaranteeing access for pharmacies that contract exclusively with the PBM.
- Generic substitution. Here, the goal is to increase the use of generic medication whenever possible. Generally, generic drugs cost 80% to 85% less than their brand name equivalents. Pharmacists may receive an incentive for dispensing a higher number of generics.
- Rebates. A rebate is money returned by the seller to the drug purchaser under certain conditions. The seller gives rebates to incentivize higher volume purchases and to stay competitive without directly lowering costs. The PBM often negotiates a rebate and reaches an agreement with the drug manufacturers. A rebate program may stimulate the PBM to increase its use of rebated drugs; on the flip side, rebates may cause the PBM to place high-priced drugs in better tiers than drugs that are more cost-effective, which creates higher out-of-pocket costs for some patients.
- Copayments. A copayment is a fixed amount that patients, insureds, or beneficiaries pay for their prescriptions. PBMs use copayments as a cost-sharing mechanism to reduce the insurer's or employer's overall medication costs. PBMs adjust copayments depending on the plan they are managing. Generic medications generally have lower copayments, but brand and some generic medications may require a higher copayment.

Do PBMs Create Value in Healthcare?

PBMs have had many significant impacts on the drug distribution system. At their inception, they created systems to replace the manual claims filing process that was dependent on paper with electronic systems that communicated among stakeholders quickly. Today's systems operate in real-time, which is advantageous to all stakeholders.[29]

Controversy surrounds PBMs (See the **SIDEBAR** on the next page). PBMs add value to their stakeholders (e.g., insurers, health systems, payors), but it is uncertain whether PBMs contribute significant value to the U.S. healthcare system. PBMs have proprietary contracts that prevent open discussion of the terms they negotiate and tools they use. Some experts allege that PBMs engage in "spread pricing," meaning they charge health plans and employers more for generic drugs than what they reimburse pharmacies for these drugs, keeping the difference. Again, a lack of transparency allows this to happen: PBMs' operations are proprietary and confidential. They often lack

SIDEBAR: Have PBMs Abused the Drug Rebate System?

The 3 major PBMs—Caremark Rx, Express Scripts (ESI), and OptumRX—are currently in the FTC's crosshairs for allegedly artificially inflating insulin drug prices. The FTC has filed an administrative complaint citing that 3 PBMs have developed and abused a drug rebate system that prioritizes high rebates from drug manufacturers, forcing consumers to spend more on life-saving medication.[25]

The crux of the issue centers on PBMs ability to establish discounts on the manufacturer's initial sticker price of brand name drugs. Drug companies will agree to these discounts in exchange for preference and availability on the PBM's formularies. As the discounts grew larger over time, pharmaceutical companies were forced to raise their initial sticker prices to maintain profits. Therefore, while PBMs have cut prices in half for their clients, patients have suffered because the price at point of service often reflects the initial sticker price.[31] Even if less expensive insulins become available, PBMs are able to design their formularies strategically to exclude those options in favor of equivalent high list price, highly rebated products.[32]

The PBMs' "chase-the-rebate" strategy has shifted the burden of high insulin prices directly to patients.[25] Take, for example, one insulin product that was listed at $122.59 in 2012. Also in 2012, PBMs introduced exclusionary drug formularies, a tactic weaponized to demand higher rebates in exchange for a desirable spot on the formulary. By 2018, the list price of that specific insulin more than doubled to $289.36. Patients with deductibles or coinsurance do not benefit from rebates at the pharmacy counter. These out-of-pocket expenses for insulin drugs are sometimes even higher than total cost of the drug to the commercial payor.[25]

All three PBMs have pushed back on the allegations from the FTC, claiming the lawsuit "demonstrates a profound misunderstanding of how drug pricing works."[32] The FTC has also acknowledged that PBMs likely did not act alone, and actions against drug manufacturers may be on the horizon. Over the last year, Eli Lily, Novo Nordisk, and Sanofi all promised significant cuts to the list price of their insulins due to public and political pressure. The recently passed Inflation Reduction Act also has chipped away at insulin prices by establishing a $35 per month cap for Medicare Part D patients.[32]

transparency and it's possible to conclude they may take value from healthcare. Some evidence exists indicating that agreements with manufacturers agreements require PBMs to exclude generic drugs and biosimilars from their formularies in exchange for higher rebates.[24,27,30]

Implications for Pharmacy Teams

Pharmacoeconomics is helpful for pharmacy teams because in a healthcare setting pharmacists need to be able to determine if a drug's value can be justified by its cost. George learned that a good way to think about cost and value is this: "Value is the results you get divided by the cost. Value is what works, not how cheap it is."[33] Pharmacy employees, especially those who work in procurement or with the P&T Committee, should understand how to differentiate between the four types of pharmacoeconomic analyses. The different analyses help engage in informed decision making between two or more interventions. Pharmacoeconomics can guide clinical and policy decision making. Today, pharmacists in community and hospital settings provide a wide variety of services including vaccinations and medication use counseling. A health economist might perform a pharmacoeconomic analysis to determine if a pharmacist's services are adding value to the healthcare system. Additionally, a payment model needs to be established to ensure pharmacists are compensated for their non-dispensing work.[34]

Red Flags in Pharmacoeconomic Studies

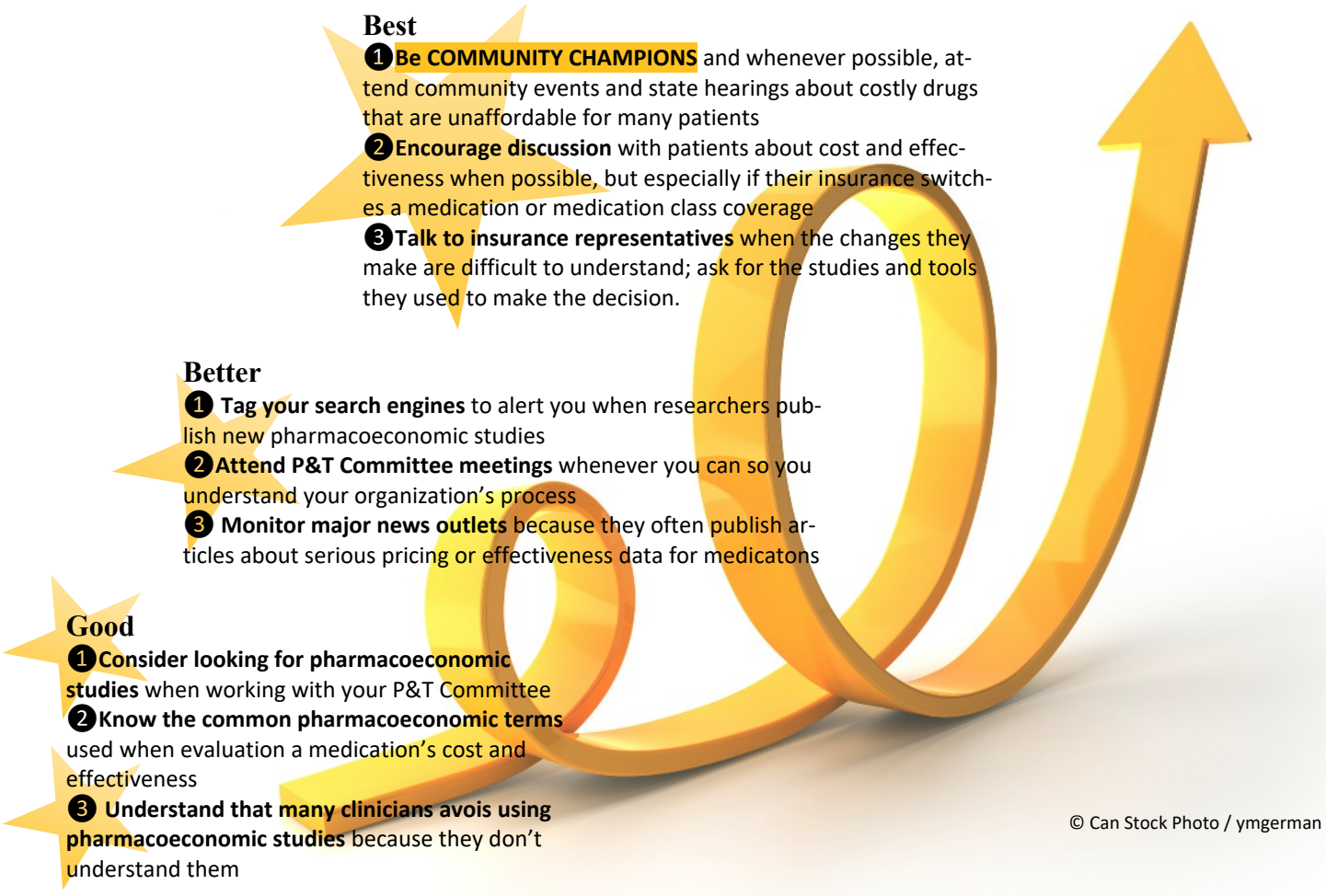
Pharmacy staff must recognize that pharmacoeconomic studies, like all studies, can be flawed. Certain red flags decrease a study's validity. Below are some common questions to ask after reading a pharmacoeconomic study. These questions help identify the study's limitations[35]:

- Does the title accurately represent the study's goals?
- Did the researchers clearly state the study's objective?
- Did the researchers use a large enough data sample? Remember that larger sample sizes lead to more reliable results.
- If the researchers compared interventions, did they use appropriate comparators?
    - ❑ If the researchers were reporting on a new treatment, did they compare it to the current standard of care or the most popular marketed options? Or did the authors compare the treatment to a less popular, less effective, or older (and retired) alternative?
- Did the researchers provide a description of the competing alternatives' use in clinical practice?
- Did the researchers identify which perspective they employed to measure the costs?
- Did the researchers indicate the study structure (retrospective, prospective, etc.)?
- Were all the costs of the interventions included?
- Did the researchers include all important clinical outcomes from various studies?
- Were the study's conclusions appropriate for the study? Or did the conclusions go beyond the scope of the target population?
- Is it possible to extrapolate the findings to your population, or are the populations too different?
- Did the researchers present the conclusions in an unbiased manner?

CONCLUSION

George was able to learn so much about pharmacoeconomics. He feels confident about the different pharmacoeconomics terms used for economic evaluations. George also recalls the advantages of pharmacoeconomic analysis and can compare the different types of analyses. Last, he better understands the PBM's role and the tools a PBM uses to lower drug costs.

Figure 1. Becoming a Pharmacoeconomic Study Champion



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