Undergraduate Certificate in Pharmacoeconomics

Quality of Life Assessment

Quality of Life (QOL) Assessment is a critical component in the field of pharmacoeconomics. It refers to the impact of a medical condition and its treatment on an individual's overall well-being, including their physical, emotional, and social functioning. QOL assessments are essential in helping healthcare professionals and policymakers make informed decisions about the most effective and cost-efficient treatments for patients. In this explanation, we will discuss key terms and vocabulary related to QOL assessment in the context of the Undergraduate Certificate in Pharmacoeconomics.

1. Quality of Life (QOL)
QOL is a multidimensional concept that encompasses an individual's physical, emotional, and social well-being. It reflects an individual's subjective evaluation of their satisfaction with their life and their ability to perform daily activities. QOL is influenced by various factors, including a person's health status, environment, and personal values.
2. Health-Related Quality of Life (HRQOL)
HRQOL is a subset of QOL that specifically focuses on the impact of a medical condition and its treatment on an individual's physical, emotional, and social functioning. HRQOL assessments measure an individual's ability to perform daily activities, their level of pain and discomfort, and their emotional well-being.
3. Utility
Utility is a term used in pharmacoeconomics to describe an individual's preference for a particular health state. It is measured on a scale of 0 to 1, with 0 representing death and 1 representing perfect health. Utilities are used to calculate Quality-Adjusted Life Years (QALYs), a standardized measure of health outcomes that takes into account both the quantity and quality of life.
4. Quality-Adjusted Life Years (QALYs)
QALYs are a standardized measure of health outcomes that take into account both the quantity and quality of life. They are calculated by multiplying the number of years of life gained by a particular treatment by the utility value of the health state experienced during those years. QALYs are used to compare the effectiveness and cost-efficiency of different treatments.
5. Health State Valuation
Health state valuation is the process of assigning utility values to different health states. There are several methods for health state valuation, including the standard gamble, time trade-off, and visual analog scale. These methods ask individuals to make hypothetical choices between different health states or to rate their preference for a particular health state on a scale.
6. Patient-Reported Outcomes (PROs)
PROs are measurements of a patient's health status that are reported directly by the patient, without interpretation by a healthcare professional. PROs can include measures of HRQOL, symptoms, and functional status. PROs are important in pharmacoeconomics because they provide insights into the

patient's perspective on their health status and treatment outcomes.
7. EQ-5D
The EQ-5D is a standardized instrument used to measure HRQOL. It consists of five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension is rated on a five-point scale, with higher scores indicating worse HRQOL. The EQ-5D also includes a visual analog scale for overall health status.
8. Short Form-36 (SF-36)
The SF-36 is a widely used instrument for measuring HRQOL. It consists of eight dimensions: physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health. Each dimension is scored on a scale of 0 to 100, with higher scores indicating better HRQOL.
9. Health Technology Assessment (HTA)
HTA is a systematic evaluation of the medical, economic, ethical, and social implications of a healthcare technology or intervention. HTAs are used to inform healthcare decision-making and policy development. QOL assessments are an essential component of HTAs because they provide insights into the impact of a healthcare technology or intervention on an individual's HRQOL.
10. Cost-Effectiveness Analysis (CEA)
CEA is a type of economic evaluation that compares the costs and outcomes of two or more healthcare interventions. CEAs are used to determine the most cost-efficient intervention, taking into account both the quantity and quality of life. QOL assessments are essential in CEAs because they allow for the calculation of QALYs, a standardized measure of health outcomes.

Example:
Imagine a pharmaceutical company is developing a new treatment for chronic pain. To determine the cost-effectiveness of the treatment, they conduct a CEA comparing the new treatment to the current standard of care. The CEA includes a QOL assessment using the EQ-5D instrument to measure HRQOL. The results show that the new treatment is more effective in reducing pain and improving HRQOL, as measured by higher EQ-5D scores. However, the new treatment is also more expensive. The CEA calculates the incremental cost-effectiveness ratio (ICER), which is the difference in costs between the two treatments divided by the difference in QALYs. If the ICER is below a willingness-to-pay threshold, the new treatment is considered cost-effective.

Practical Application:
QOL assessments are essential in pharmacoeconomics because they provide insights into the impact of a medical condition and its treatment on an individual's overall well-being. By incorporating QOL assessments into CEAs, healthcare decision-makers can make informed decisions about the most cost-efficient treatments for patients. PROs, such as HRQOL measures, can provide valuable information about the patient's perspective on their health status and treatment outcomes. Standardized instruments, such as the EQ-5D and SF-36, can facilitate comparisons across different treatments and populations.

Challenges:
There are several challenges in conducting QOL assessments in pharmacoeconomics. First, QOL is a subjective concept, and different individuals may have different perceptions of what constitutes a good quality of life. Second, HRQOL measures may be influenced by factors unrelated to the medical condition or its treatment, such as socioeconomic status or cultural background. Third, there is no consensus on the best method for health state valuation, and different methods may yield different utility values. Finally, QOL assessments can be time-consuming and expensive, which may limit their use in routine clinical practice.

Conclusion:
QOL assessments are a critical component in the field of pharmacoeconomics. They provide insights into the impact of a medical condition and its treatment on an individual's overall well-being, including their physical, emotional, and social functioning. HRQOL measures, such as the EQ-5D and SF-36, can facilitate comparisons across different treatments and populations. CEAs that incorporate QOL assessments can help healthcare decision-makers make informed decisions about the most cost-efficient treatments for patients. However, there are several challenges in conducting QOL assessments, including the subjective nature of QOL, the influence of extraneous factors on HRQOL measures, the lack of consensus on health state valuation methods, and the time and cost involved in conducting QOL assessments. Nonetheless, QOL assessments remain an essential tool in pharmacoeconomics, providing valuable insights into the impact of medical interventions on patients' lives.

Quality of Life (QoL) is a multidimensional concept that refers to an individual's overall well-being, encompassing physical, emotional, mental, and social aspects. QoL assessment is the process of evaluating an individual's QoL, which can be used to inform healthcare decisions and policies.

There are two main types of QoL assessment: generic and disease-specific. Generic QoL measures assess overall well-being and are applicable to all populations. Examples include the Short Form-36 (SF-36) and the World Health Organization Quality of Life BREF (WHOQOL-BREF). Disease-specific QoL measures, on the other hand, assess the impact of a specific condition or treatment on an individual's QoL. Examples include the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) for cancer patients and the Parkinson's Disease Questionnaire (PDQ-39) for individuals with Parkinson's disease.

Health-related Quality of Life (HRQoL) is a subset of QoL that focuses on the impact of health and healthcare on an individual's QoL. HRQoL measures typically assess symptoms, functional status, and overall well-being.

Patient-Reported Outcomes (PROs) are reports on the status of a patient's health condition that come directly from the patient, without interpretation by a clinician. PROs can include QoL measures, symptom scales, and functional status measures.

Clinical Outcomes Assessments (COAs) are measures of a patient's health status or the impact of a

healthcare intervention on a patient's health status. COAs include PROs as well as clinician-reported outcomes and observer-reported outcomes.

Psychometrics is the field of study concerned with the theory and techniques of mental measurement. In the context of QoL assessment, psychometrics involves the development and validation of QoL measures. Key psychometric properties of QoL measures include reliability (the consistency of a measure over time and across different raters), validity (the extent to which a measure measures what it is intended to measure), and responsiveness (the ability of a measure to detect change over time).

Utility is a term used in healthcare economics to describe the value that an individual places on a particular health state. Utilities are typically measured on a scale of 0 (representing death) to 1 (representing perfect health). Utilities can be used to calculate quality-adjusted life years (QALYs), which are a measure of health outcomes that take into account both the quantity and quality of life.

Standard Gamble (SG) and Time Trade-Off (TTO) are two methods used to elicit utilities from individuals. The SG method involves presenting an individual with a hypothetical choice between a certain health state and a gamble with a probability of achieving a better health state. The TTO method involves presenting an individual with a hypothetical choice between a certain health state and a shorter period of time in a better health state.

Quality-adjusted life years (QALYs) are a measure of health outcomes that take into account both the quantity and quality of life. QALYs are calculated by multiplying the number of years of life gained by a healthcare intervention by the utility value of the health state experienced during those years.

QoL assessment is an important tool in healthcare decision-making and policy development. It can be used to evaluate the effectiveness of healthcare interventions, inform resource allocation decisions, and identify areas for improvement in healthcare delivery. However, there are also challenges associated with QoL assessment, including the subjective nature of QoL, the potential for response bias, and the need for psychometrically sound measures.

One practical application of QoL assessment is in the evaluation of new healthcare technologies. For example, a pharmaceutical company developing a new drug may use QoL measures to assess the impact of the drug on patients' symptoms, functional status, and overall well-being. This information can be used to inform regulatory decisions, reimbursement decisions, and marketing strategies.

Another practical application of QoL assessment is in the evaluation of healthcare policies. For example, a health system may use QoL measures to assess the impact of a new policy aimed at improving patient care. This information can be used to inform future policy decisions and identify areas for improvement.

Challenges in QoL assessment include the need for standardized and validated measures, the potential for response bias, and the need to balance the desire for comprehensive assessment with the burden on patients of completing lengthy questionnaires. Additionally, there is often a lack of consensus on the most

appropriate QoL measures to use in a given context, and there may be cultural and linguistic barriers to the use of QoL measures in diverse populations.

In conclusion, QoL assessment is a multidimensional concept that refers to the evaluation of an individual's overall well-being. QoL measures can be generic or disease-specific and can be used to inform healthcare decisions and policies. Key psychometric properties of QoL measures include reliability, validity, and responsiveness. Utilities are used to calculate QALYs, which are a measure of health outcomes that take into account both the quantity and quality of life. QoL assessment is an important tool in healthcare decision-making and policy development, but there are also challenges associated with its use. Practical applications of QoL assessment include the evaluation of new healthcare technologies and healthcare policies. Challenges in QoL assessment include the need for standardized and validated measures, the potential for response bias, and the need to balance comprehensiveness with patient burden.

Quality of Life (QoL) is a broad, multidimensional concept that assesses an individual's overall well-being, including their physical, emotional, and social health. It is a subjective measure that reflects an individual's perception of their position in life, taking into account their culture, values, goals, expectations, and standards.

Health-Related Quality of Life (HRQoL) is a subset of QoL that focuses specifically on the impact of health status on an individual's QoL. HRQoL includes measures of physical function, emotional well-being, social relationships, and general perceptions of health.

Generic HRQoL Instruments are questionnaires or surveys that can be used to assess HRQoL in a wide range of populations and health conditions. Examples include the Short Form-36 (SF-36) and the EuroQol-5D (EQ-5D).

Disease-Specific HRQoL Instruments are questionnaires or surveys that are tailored to assess HRQoL in specific health conditions or populations. Examples include the Parkinson's Disease Questionnaire (PDQ-39) and the Functional Assessment of Cancer Therapy-General (FACT-G).

Utility Values are numerical values that reflect an individual's preference for a particular health state. Utility values range from 0 (representing death) to 1 (representing perfect health). These values are used in economic evaluations to estimate Quality-Adjusted Life Years (QALYs), which take into account both the length and quality of life.

Quality-Adjusted Life Years (QALYs) are a measure of health outcomes that combine both the length and quality of life. QALYs are calculated by multiplying the number of years of life gained by a particular intervention by the utility value of the health state experienced during those years.

Clinical Outcomes Assessment (COA) is a systematic approach to evaluating the effects of a medical treatment or intervention on patient outcomes. COAs can include HRQoL measures, as well as clinical measures such as survival, disease progression, and symptom burden.

Patient-Reported Outcomes (PROs) are health outcomes that are reported directly by the patient, without interpretation by a clinician or other third party. PROs can include HRQoL measures, symptom burden, and other aspects of health status.

Clinical Significance refers to the degree to which a medical intervention or treatment has a meaningful impact on patient outcomes. Clinical significance is determined by evaluating the magnitude of the effect, the statistical significance of the results, and the clinical relevance of the outcome.

Economic Evaluation is a systematic approach to comparing the costs and benefits of different medical interventions or treatments. Economic evaluations can be used to inform decisions about resource allocation and to determine the cost-effectiveness of different treatment options.

Cost-Effectiveness Analysis (CEA) is a type of economic evaluation that compares the costs and outcomes of different medical interventions or treatments. CEA is expressed as a ratio of costs to outcomes, with the outcome typically measured in natural units (e.g., life years gained or cases prevented).

Cost-Utility Analysis (CUA) is a type of economic evaluation that compares the costs and outcomes of different medical interventions or treatments. CUA is expressed as a ratio of costs to QALYs, which take into account both the length and quality of life.

Budget Impact Analysis (BIA) is a type of economic evaluation that assesses the financial impact of adopting a new medical intervention or treatment on a healthcare system or budget. BIA takes into account the number of patients who are likely to receive the intervention, the cost of the intervention, and the impact on other healthcare expenditures.

Sensitivity Analysis is a technique used in economic evaluations to assess the impact of uncertainty on the results. Sensitivity analysis involves varying the assumptions and inputs used in the analysis to determine how they affect the outcome.

Discounting is a technique used in economic evaluations to adjust for the time value of money. Discounting involves reducing the value of future costs and benefits to their present value, taking into account the prevailing interest rate.

Incremental Cost-Effectiveness Ratio (ICER) is a measure of the additional cost of achieving one additional unit of outcome (e.g., QALY) with a new medical intervention or treatment compared to the standard of care. ICER is expressed as a ratio of the difference in costs to the difference in outcomes.

Threshold Analysis is a technique used to determine the maximum amount that a decision-maker is willing to pay for an additional unit of outcome (e.g., QALY). Threshold analysis involves varying the willingness-to-pay threshold to determine the point at which the intervention becomes cost-effective.

Probabilistic Sensitivity Analysis (PSA) is a technique used to assess the impact of uncertainty on the results of an economic evaluation. PSA involves assigning probability distributions to the inputs and running the

analysis multiple times to generate a distribution of possible outcomes.

Decision Analytic Modeling (DAM) is a technique used to evaluate the costs and outcomes of different medical interventions or treatments. DAM involves creating a mathematical model that simulates the natural history of a disease and the impact of different treatment options.

Markov Model is a type of DAM that uses a series of health states and transition probabilities to simulate the natural history of a disease and the impact of different treatment options. Markov models are particularly useful for evaluating chronic diseases where patients can move between different health states over time.

Microsimulation Model is a type of DAM that simulates the experience of individual patients over time. Microsimulation models are particularly useful for evaluating interventions where the impact of the intervention may vary between individual patients.

In conclusion, the field of Quality of Life Assessment in pharmacoeconomics involves a wide range of key terms and vocabulary that are essential for understanding the impact of medical interventions on patient outcomes. These terms include measures of HRQoL, utility values, QALYs, COAs, PROs, clinical significance, economic evaluation, CEA, CUA, BIA, sensitivity analysis, discounting, ICER, threshold analysis, PSA, DAM, Markov Model, and microsimulation model. Understanding these concepts is critical for informing decisions about resource allocation and determining the cost-effectiveness of different treatment options. By using these terms and concepts appropriately, healthcare professionals and decision-makers can make informed decisions that improve patient outcomes while also being mindful of the financial implications of those decisions.

Quality of Life (QoL) Assessment is a critical aspect of pharmacoeconomics, as it helps to evaluate the impact of medical interventions on a patient's overall well-being. In this response, we will discuss key terms and vocabulary related to QoL assessment in the context of the Undergraduate Certificate in Pharmacoeconomics.

1. Quality of Life (QoL)
QoL is a multidimensional concept that encompasses an individual's physical, emotional, and social well-being. It is a subjective experience that can be influenced by various factors, including health status, personal relationships, and environmental conditions.
2. Health-Related Quality of Life (HRQoL)
HRQoL is a subset of QoL that specifically focuses on the impact of health status on an individual's well-being. HRQoL includes dimensions such as physical functioning, emotional well-being, social relationships, and general health perceptions.
3. Instruments for QoL Assessment
Instruments for QoL assessment are standardized tools used to measure an individual's QoL. These instruments can be generic or disease-specific and may include questionnaires, interviews, or observational

measures. Examples of commonly used instruments include the Short-Form 36 (SF-36), the EuroQol five-dimension scale (EQ-5D), and the Hospital Anxiety and Depression Scale (HADS).

4. Validity and Reliability

Validity and reliability are essential characteristics of QoL instruments. Validity refers to the degree to which an instrument measures what it is intended to measure, while reliability refers to the consistency of measurement over time or across different raters.

5. Utility Values

Utility values are a measure of an individual's preferences for different health states. These values are often used in pharmacoeconomic analyses to estimate quality-adjusted life years (QALYs), which combine measures of both quantity and quality of life.

6. Generic and Disease-Specific Instruments

Generic QoL instruments are designed to measure QoL across a broad range of health conditions, while disease-specific instruments focus on measuring QoL in a particular disease or condition. Examples of generic instruments include the SF-36 and the EQ-5D, while disease-specific instruments include the Parkinson's Disease Questionnaire (PDQ-39) and the Functional Assessment of Cancer Therapy-General (FACT-G).

7. Multi-Attribute Utility Theory (MAUT)

MAUT is a theoretical framework used to estimate utility values for different health states. MAUT involves assigning weights to different attributes or dimensions of QoL, such as physical functioning or social relationships, and then combining these weights to estimate overall utility.

8. Patient-Reported Outcomes (PROs)

PROs are measures of an individual's health status or QoL that are reported directly by the patient. PROs can include symptoms, functional status, or QoL and can be used to assess the effectiveness of medical interventions.

9. Health State Descriptions

Health state descriptions are detailed descriptions of different health states that can be used to estimate utility values. Health state descriptions may include information about symptoms, functional status, and treatment options.

10. Time Trade-Off (TTO)

TTO is a technique used to estimate utility values for different health states. TTO involves asking individuals to choose between a hypothetical health state and a shorter period of time in full health. The length of time in full health is then varied until the individual is indifferent between the two options.

11. Standard Gamble (SG)

SG is another technique used to estimate utility values for different health states. SG involves asking individuals to choose between a hypothetical health state and a gamble with two outcomes: full health or immediate death. The probability of full health is then varied until the individual is indifferent between the two options.

12. Quality-Adjusted Life Years (QALYs)

QALYs are a measure of both the quantity and quality of life. QALYs are calculated by multiplying the

number of years of life gained by a medical intervention by the utility value of the resulting health state.
13. Sensitivity Analysis
Sensitivity analysis is a technique used to assess the robustness of pharmacoeconomic analyses. Sensitivity analysis involves varying the assumptions or inputs of a model to determine how they impact the results.
14. Cost-Utility Analysis (CUA)
CUA is a type of pharmacoeconomic analysis that compares the costs and QALYs of different medical interventions. CUA is often used to evaluate the cost-effectiveness of interventions that impact QoL.
15. Cost-Effectiveness Analysis (CEA)
CEA is another type of pharmacoeconomic analysis that compares the costs and outcomes of different medical interventions. CEA is often used to evaluate the cost-effectiveness of interventions that impact morbidity or mortality.

QoL assessment is a critical component of pharmacoeconomic analyses, as it allows for the evaluation of the impact of medical interventions on an individual's overall well-being. Understanding the key terms and vocabulary related to QoL assessment is essential for students in the Undergraduate Certificate in Pharmacoeconomics. By utilizing standardized instruments, utility values, and PROs, pharmacoeconomic analyses can provide valuable insights into the cost-effectiveness of medical interventions and inform decision-making in healthcare.

Quality of Life (QoL) is a multidimensional concept that refers to an individual's overall well-being and satisfaction with their health status, functional ability, and psychosocial factors. QoL assessment is a critical component of pharmacoeconomic evaluations, as it helps to quantify the impact of pharmaceutical interventions on patients' daily lives. In this response, we will discuss the key terms and vocabulary related to Quality of Life assessment in the context of the Undergraduate Certificate in Pharmacoeconomics.

1. Health-Related Quality of Life (HRQoL): HRQoL is a subset of QoL that specifically focuses on the impact of health status on an individual's daily life. HRQoL includes physical, emotional, and social functioning, as well as symptoms related to a specific health condition.
2. Utility: Utility is a preference-based measure of HRQoL that reflects an individual's preference for a particular health state. Utilities are often measured on a scale of 0 to 1, where 0 represents death and 1 represents perfect health. Utilities can be used to calculate Quality-Adjusted Life Years (QALYs), a commonly used outcome measure in pharmacoeconomic evaluations.
3. Quality-Adjusted Life Years (QALYs): QALYs are a measure of health outcomes that take into account both the quantity and quality of life. QALYs are calculated by multiplying the number of years of life gained by a particular intervention by the utility value associated with that health state. For example, if a patient gains 5 years of life with a utility value of 0.8, the QALYs gained would be 4 (5 x 0.8).
4. EQ-5D: The EQ-5D is a commonly used instrument for measuring HRQoL. It consists of five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and a visual analog scale (VAS) for measuring overall health status. The EQ-5D can be used to calculate utilities using a set of preference weights.

5. Short-Form Health Survey (SF-36): The SF-36 is a widely used instrument for measuring HRQoL. It consists of eight dimensions (physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health) and can be used to calculate a physical component score (PCS) and a mental component score (MCS).
6. Health State Valuation: Health state valuation is the process of assigning utility values to specific health states. Health state valuation can be conducted using methods such as time trade-off (TTO), standard gamble (SG), or visual analog scale (VAS).
7. Patient-Reported Outcomes (PROs): PROs are measures of health status that are reported directly by patients. PROs can include HRQoL measures, symptom measures, or functional status measures. PROs are becoming increasingly important in pharmacoeconomic evaluations as they provide valuable information on the patient perspective.
8. Minimally Important Difference (MID): MID is the smallest change in a HRQoL measure that is considered clinically meaningful to patients. MID values can be used to interpret the results of pharmacoeconomic evaluations and determine whether a particular intervention is cost-effective.
9. Responsiveness: Responsiveness is the ability of a HRQoL measure to detect changes in health status over time. Responsiveness is an important consideration in pharmacoeconomic evaluations as it can impact the interpretation of cost-effectiveness results.
10. Ceiling Effect: Ceiling effect occurs when a HRQoL measure is unable to detect changes in health status at the higher end of the scale. Ceiling effect can be a concern in pharmacoeconomic evaluations as it can lead to underestimation of the benefits of a particular intervention.

Practical Applications:

HRQoL measures are commonly used in pharmacoeconomic evaluations to assess the impact of pharmaceutical interventions on patients' daily lives. For example, a pharmacoeconomic evaluation of a new treatment for chronic pain may use an HRQoL measure such as the EQ-5D to assess changes in patients' physical and emotional functioning over time. The utilities associated with the HRQoL measures can then be used to calculate QALYs gained, which can be used to determine the cost-effectiveness of the intervention.

Challenges:

One challenge in using HRQoL measures in pharmacoeconomic evaluations is ensuring that the measures are valid, reliable, and sensitive to changes in health status. Another challenge is the potential for ceiling effects, which can lead to underestimation of the benefits of a particular intervention. Additionally, there may be inconsistencies in the methods used to assign utility values to specific health states, which can impact the interpretation of cost-effectiveness results.

Examples:

An example of the use of HRQoL measures in pharmacoeconomic evaluations is a study that compared the cost-effectiveness of two treatments for rheumatoid arthritis. The study used the EQ-5D to assess changes

in HRQoL over time and calculated QALYs gained for each treatment. The results showed that the newer treatment was more cost-effective than the older treatment due to greater improvements in HRQoL.

Another example is a study that evaluated the cost-effectiveness of a new treatment for depression. The study used the SF-36 to assess changes in HRQoL and calculated QALYs gained for the new treatment compared to standard care. The results showed that the new treatment was cost-effective due to greater improvements in HRQoL and reduced healthcare utilization.

In conclusion, QoL assessment is a critical component of pharmacoeconomic evaluations, as it helps to quantify the impact of pharmaceutical interventions on patients' daily lives. HRQoL measures are commonly used in pharmacoeconomic evaluations to assess changes in physical, emotional, and social functioning over time. Utilities associated with HRQoL measures can be used to calculate QALYs gained, which can be used to determine the cost-effectiveness of a particular intervention. However, there are challenges in using HRQoL measures in pharmacoeconomic evaluations, including ensuring the validity, reliability, and sensitivity of the measures, and addressing potential ceiling effects and inconsistencies in utility value assignments. Examples of the use of HRQoL measures in pharmacoeconomic evaluations demonstrate the importance of considering QoL outcomes in determining the cost-effectiveness of pharmaceutical interventions.

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