POST GRADUATE PROGRAM IN PUBLIC HEALTH, FACULTY OF MEDICINE, UNIVERSITAS GADJAH MADA, YOGYAKARTA

COURSE TITLE : MEDICINE EVALUATION (SAFETY AND EFFICACY EVALUATION)

KUI : 7751
Credit : 2
Course type : Mandatory
Semester : III

CLASS SESSIONS
Class Day : See Schedule
Class Start Time : See schedule
Class Location : Faculty of Medicine UGM
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COURSE COORDINATOR(S)
Sri Suryawati, Prof. Dr.
NIDN :
Phone/Fax :
Email :
Office Location :
Office Hours :

TEACHING ASSISTANT(S)

1. **Sulanto saleh Danu R, dr, SpFK**
   NIDN :
   Phone/Fax :
   Email :
   Office Location :
   Office Hours :

2. **Rustamaji, dr, M.Kes**
   NIDN : 0508016805
   Phone/Fax :
   Email : rustamajifarklin@ugm.ac.id
   Office Location :
   Office Hours :

PREREQUISITES
Tidak Ada

COURSE DESCRIPTION
During the past 70 years, new drug developments have revolutionized the practice of drugs, converting many once fatal diseases into almost routine therapeutic exercises. Once cause of this medical advance has been a fundamental improvement in the means of developing and testing new drugs. This process has been greatly accelerated by new technology, by financial motivation, and by government support of medical research.

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In the other hand however, drug regulatory authorities should ensure that only good drugs with least harm are used in their countries. That is the main reason why drug evaluation takes an important place in the pre-marketing approval process. Drug evaluation covers four main aspects, i.e., quality, efficacy, safety, and labeling. This module will focus on the efficacy and safety aspects.

COURSE AIMS

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COURSE LEARNING OUTCOME

Students who successfully complete this course will be able to:

a) Understand the steps in drug development
b) Understand the framework of drug evaluation on efficacy and safety
c) Understand the importance of toxicological data and be able to evaluate toxicological data
d) Understand the importance of pharmacodynamic data and be able to evaluate pharmacodynamic data
e) Understand the importance of pharmacokinetic data and be able to evaluate pharmacokinetic data
f) Understand the importance of clinical data and be able to evaluate clinical data
g) Be able to evaluate dossiers for their correctness and completeness of documents needed for efficacy and safety evaluation
h) Be able to conduct drug evaluation on efficacy and safety
i) Be able to produce executive summary of the evaluation

ASSESSMENT AND GRADING POLICY

Student grades will be based on:

1. Tutorial 30%
2. Mid term 20%
3. Final Exam 50%

COURSE REQUIREMENTS

[Insert expectations related to class performance and policies related to late assignments, attendance, original work, citations, incomplete grades, etc.]

Akomodasi untuk penderita diasability and pregnancy.
Decribe, formulate, create, taxonomi Bloom,

COURSE STRUCTURE

The training material is provided in seven sections:

Session 0: Introduction
(2 hours)
Session 1: Steps in drug development and framework of drug evaluation
(4 hours)
Session 2: Evaluation of toxicology data
(2 Hours + Tutorial)
Session 3: Evaluation of pharmacodynamic data

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(2 Hours + Tutorial)
Session 4: Evaluation of pharmacokinetic data
(2 Hours + Tutorial)
Session 5: Evaluation of clinical trial
(2 Hours + Tutorial)
Session 6: Evaluation of new drug application dossier
(2 Hours + Tutorial)

Training material provided in each Session includes Session Guide, Session Note, Worksheets, Trainers guide, Reading, and Exercise. *Session guide* describes the background, objective of the session, the flow of the activities, and the time allocation. *Session note* provides participants with key points of the topic. Some sessions cover activities. The activity guides are provided in the Session notes, and if necessary, *worksheets* are attached. *Trainers guid*e is Power Point presentation slides for use by facilitators. *Readings* are copies of articles copied from textbooks, they are provided for participants and facilitators for references. The articles should be updated periodically. *Exercise* is articles copied from peer-reviewed journals for small group exercise. They should be updated, depending on the needs and the trend in global drug development.

UGM POLICIES AND EXPECTATIONS
Students and faculty have a shared commitment to the UGM's mission, values and oath.

Academic Integrity
Students are required to adhere to the UGM Code, available online at http://

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COURSE SCHEDULE

Please see the lecture section of Courseworks to download the readings, exams, and lecture slides.

Session 1 – STEPS IN DRUG DEVELOPMENT AND DRUG EVALUATION FRAMEWORK	
Introduction:	This session will discuss the process by which new drugs are discovered, where toxicology, pharmacodynamics, pharmacokinetics, and clinical studies are taking parts, and the efficacy and safety evaluation process following the steps. Requirements for each step are discussed in general. Discussion also covers difficulties in sorting out and checking the documents submitted for registration for completeness and correctness.
Session objectives:	After attending this session, participants are expected to be able: · to explain steps in drug development process · to explain the prerequisites of each step in drug development · to explain the evaluation process · to evaluate the completeness and correctness of documents submitted for drug registration
Activities:	1. Lecture and discussion (40 minutes) 2. Activity 1 (10 minutes) Suryadipine Case 3. Activity 2 (10 minutes) Lactobacsurya Case 4. Activity 3 (50 minutes) Working with dossiers 5. Plenary discussion and wrap up (10 minutes)
Time:	2 hours (120 minutes)
Reading:	Berkowitz, BA & Katzung, BG (2015) Basic and clinical evaluation of new drug. In: Katzung, BG, (ed) (2015) *Basic and Clinical Pharmacology*, 13th edition. Lange Medical Books/ Mc Graw- Hill, New York. Spilker B (1996) Drug development and approval processes. In: TM Speight & NHG Holford (eds.) *Avery's Drug Treatment*, 4th edition. ADIS Press, Auckland. Boxtel CJ, Santoso B, Edward IR (eds) (2008) Drug benefit and Risks. 2nd Edition. IOS Press. Amsterdam. BPOM, Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor HK.03.1.23.10.11.08481 tahun 2011, BPOM RI, Jakarta.
Dosen Pengajar	dr. Sulanto S. Danu, SpFK

Session 2 – EVALUATION OF TOXICOLOGY DATA	
Background:	Systematic pre-clinical toxicology studies are required to screen molecules which are proposed as drug candidates. These studies consist of general toxicology studies and

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	specific toxicological studies. General toxicology studies aim at collecting information on the toxic dose of the drug candidates and the spectrum of adverse effects that are produced within the studied doses. This information is used as the basis for calculating the first dose to be given as a start in the early phase of clinical studies. Specific toxicology studies learn whether the drug candidates have carcinogenic or mutagenic effects, and whether they affect the male or female reproductive system. This session discusses each type of toxicology studies and how to use the findings in drug evaluation process.
Session objectives:	After attending this session, participants are expected to be able: · to explain different types of toxicology studies · to explain the usefulness of information collected from each toxicology studies · to evaluate the toxicology data submitted in the dossier
Activity:	1. Brief lecture and discussion on types of toxicology studies (40 min) 2. Brief lecture and discussion on framework for toxicology evaluation (20 min) 3. Exercise: Evaluation of toxicology data (60 min) 4. Plenary discussion (30 min)
Time:	2.5 hours (150 minutes) and tutorial
Further reading:	Berkowitz BA & Katzung BG, 2015, Basic and clinical evaluation of new drugs. In: BG Katzung (ed) (2015) Basic and Clinical Pharmacology, 13th edition. Lange Medical Books, New York.
Dosen Pengajar	dr. Sulanto S. Danu, SpFK

Session 3 – EVALUATION OF PHARMACODYNAMIC DATA	
Background:	The discoveries of new drugs require effective methods or procedures of drugs evaluation to ensure that only safe and effective drugs that fulfill certain criteria are to be accepted and approved for clinical use. The evaluation procedure understandably consists of various relevant and important elements. While people are usually most concerned with the aspects toxicological testing and clinical trial which respectively are associated with the safety and efficacy of drugs, evaluating the pharmacodynamics of new drugs should also become the integral part of the evaluation procedure. Complementary to pharmacokinetic studies, pharmacodynamic studies disclose the pharmacological profiles of the new drug including its mechanisms, either in animal or human, supporting the safe and effective use of drugs after its final step of development.
Session objectives:	After attending this session, participants are expected to be able: - To explain the pharmacodynamic effect of a new drug - To explain the mechanism of action of a new drug - To evaluate the pharmacodynamic studies in pre-clinical and clinical section of a

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	dossier - To write up an executive summary of the evaluation
Activity:	1. Discussion on framework for pharmacodynamic evaluation (40 min) 2. Exercise: Evaluation of pharmacodynamic data (60 min) 3. Plenary discussion (20 min) 4. Writing up an executive summary of the evaluation (30 min)
Time:	2.5 hours (150 minutes) + Tutorial
Further reading:	Henry, R, Bourne, and Zastrow,M (2015) Drug receptors and pharmacodynamics. In: Katzung, B.G (ed) (2015) *Basic and Clinical Pharmacology*, 10th edition. Lange Medical Books/Mc Graw-Hill, New York. Vogel, H.G. (2002) *Drug Discovery and Evaluation*, 2nd edition, Spinger, Berlin.
Dosen Pengajar	dr. Sulanto S. Danu, SpFK

Session 4 – EVALUATION OF PHARMACOKINETIC DATA	
Background:	Pharmacokinetic studies are performed in both pre-clinical and clinical phases. Pre-clinical studies provide information on the drug absorption, distribution, elimination, and the metabolic pathways. The aim of preclinical studies is providing information on therapeutic range and the dosage regimen in the later use in clinical studies. In the clinical phase, pharmacokinetic studies aim at confirming the therapeutic range and dosage regimen. This session discusses the range of information that can be obtained from pre-clinical and clinical studies, and the framework of pharmacokinetic evaluation.
Session objectives:	After attending this session, participants are expected to be able: - To explain the pharmacokinetic profiles of a new drug based on animal and human data - To explain pharmacokinetic properties that need follow-up in clinical trials - To evaluate the pharmacokinetic studies in pre-clinical and clinical section of a dossier - To write up an executive summary of the evaluation
Activity:	1. Discussion on framework for pharmacodynamic evaluation (40 min) 2. Exercise: Evaluation of pharmacodynamic data (60 min) 3. Plenary discussion (20 min) 4. Writing up executive summary (30 min)
Time:	2.5 hours (150 minutes) + Tutorial
Further reading:	Nicholas HG and Holford MB (2015) Pharmacokinetics and pharmacodynamics: Rational dosing and the time course of drug action. In: Katzung BG (ed) Basic & Clinical Pharmacology 13th ed. Lange Medical Books/McGraw-Hill, New York.

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Dosen Pengajar	dr. Rustamaji, M.Kes

Session 5 – EVALUATION OF CLINICAL TRIAL REPORTS	
Background:	A treatment is aimed at alleviating the symptom and curing a disease, or preventing the emergence of a disease. Clinical efficacy of a new drug must be higher than the risk. To evaluate the efficacy and safety of a new drug, it is important to understand the clinical trial methodology. This session will discuss components that should be included in a clinical trial. By mastering this subject, participants are provided with beneficial information to evaluate critically efficacy and safety of a new drug.
Session objectives:	After attending this session, participants are expected to be able to: 1. Explain the background, importance and objective of a clinical trial. 2. Explain the components of a clinical trial. 3. Conducting critical appraisal on a clinical trial report.
Activity:	1. Discussion on framework critical appraisal (40 min) 2. Exercise: Evaluation of a clinical trial report (60 min) 3. Plenary discussion (20 min) 4. Writing up an executive summary of the evaluation (30 min)
Time:	2.5 hours (150 minutes)
Reading Material	
Dosen Pengajar	dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes

Session 6 – EVALUATION OF MEDICINE DOSSIER	
Background:	Decision to accept or reject an application of a new drug should be supported by evidences of efficacy and safety. Drug evaluators therefore should be of high knowledge and skills in evaluating the documents submitted for application. This session provides participants with skills in evaluating the evidences of efficacy and safety of a new drug, make a decision, and produce an executive summary of the evaluation.
Session objectives:	After attending this session, participants are expected to be able: - To explain components of drug evaluation - To evaluate a dossier submitted as a new drug or a new indication - To produce an executive summary of drug evaluation on efficacy and safety
Activity:	1. Discussion on components of drug evaluation (30 min) 2. Exercise: Evaluation of a dossier (180 min) 3. Produce an executive summary (home work)
Time:	Home work 3 days. During home work period consultation with lecturer can be done with appointment.

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Reading Material	
Dosen Pengajar	dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes

Session – FINAL EXAMINATION
[Date]

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LABORATORY OR TUTORIAL SCHEDULE

Please see the web to download the readings, data, computer program and lecture slides.

Session 1 – Evaluation on Toxicity Data	
[Date]	Learning Objectives: ▪ Student undersand about acute toxiciity data ▪ Student understand about sub acute toxicity data ▪ Student understand about chronic toxicity data ▪ Student undersatnd about special tocicity data ▪ Students able to made a executive summary on toxicology data Reading : • . • • Assignment: Evaluation of toxicity data **Dosen Pengajar :** dr. Sulanto S. Danu, SpFK

Session 2 –Evaluation on Pharmacodinamic Data	
[Date]	Learning Objectives: Student understand animal pharmacodinamic data Student understand human pharmacodinamic data Students capable to evaluate pharmacodinamic data Reading : • . • • Assignment: Evaluation of Pharmacodinamic data **Dosen Pengajar :** dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes

Session 3 – Evalution on Pharmacokinetic Data	
[Date]	Learning Objectives: Student understand animal pharmacokinetics data Student understand human pharmacokineics data

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Students capable to evaluate pharmacokinetics data

Reading :

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Assignment:
Evaluation of Pharmacodinamic data

Dosen Pengajar : dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes

Session 4 – Evaluation on Clinical Trial Data	
[Date]	Learning Objectives: Student understand principles of clinical trial report Student understand use of clinical trial data on medicine evaluation Student capable to evaluate clinical trial data Reading : • . • • Assignment: Evaluation of clinical trial report **Dosen Pengajar :** dr. Rustamaji, M.Kes/ dr. Sulanto S. Danu, SpFK

Session 5 – Dosier Devaluation	
[Date]	Learning Objectives: ▪ Student capable to made a review of dosier Reading : • . • • Assignment: Evaluation of Dosier **Dosen Pengajar**

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NAMA MATA KULIAH : EVALUASI KHASIAT DAN KEAMANAN OBAT
Kode /SKS : ..... / 2 SKS
Semester : 3 (Tiga) – kuliah minat MKO
Koordinator : Prof. Dr. Sri Suryawati
Tim pengajar : dr.Sulanto S Danu,SpFK, Prof.Dr.Sri Suryawati, dr.Rustamaji,M.Kes

Topik Mata Kuliah

Pertemuan	Waktu	Pokok Bahasan	Dosen
1.		Introduction Pentingnya Evaluasi Obat	Prof. Dr. Sri Suryawati/ dr. Sulanto S. Danu, SpFK
2.		Perkembangan Obat (Drug Development)	dr. Sulanto S. Danu, SpFK
3.		Evaluasi Toksikologi	dr. Sulanto S. Danu, SpFK
4.		Tutorial Toksikologi	dr. Sulanto S. Danu, SpFK
5.		Evaluasi Farmakokinetik	dr. Rustamaji, M.Kes
6.		Evaluasi Farmakodinamik	dr. Sulanto S. Danu, SpFK
7.		Tutorial Evaluasi Farmakodinamik	dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes
8.		Tutoprial Evaluasi Farmakokinetik	dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes
9.		Evaluasi Uji Klinik	dr. Sulanto S. Danu, SpFK/ dr. Rustamaji, M.Kes
10.		Evaluasi Uji Klinik	dr. Rustamaji, M.Kes/ dr. Sulanto S. Danu, SpFK
11.		Tutorial Evaluasi Uji Klinik	dr. Rustamaji, M.Kes/ dr. Sulanto S. Danu, SpFK
12.		Evaluasi Dosier	dr. Rustamaji, M.Kes/ dr. Sulanto S. Danu, SpFK
13.		Tutorial Evaluasi	Tim
14.		Tutorial Evaluasi	Tim