Mapping the Informed Health Choices (IHC) Key Concepts (KC) to core concepts for the main steps of Evidence-Based Health Care (EBHC).

KC No	KC Short Title	KC Statement	EBHC concept	EBHC sub concept	EBHC statement	EBHC Step	Reported
1.01	Treatments can harm	Treatments may be harmful	Explain the use of harm/aetiologies study for (rare) adverse effects of interventions.	Indicate that common treatment harms can usually be observed in controlled trials, but some rare or late harms will only be seen in observational studies.	While critical appraisal of such studies is not a core skill, learner needs to indicate when and why they are needed. Also, learners need to recognise that treatment may be harmful and increasing the amount of an effective treatment does not necessarily increase the benefits of a treatment and may cause harm	Appraise	Explicitly
1.02	Anecdotes are unreliable evidence	Personal experiences or anecdotes are an unreliable basis for assessing the effects of most treatments.	Know the rationale and origin of EBP.	Recognise the disparity between our diagnostic skills and clinical judgment, which increase with experience, and our up-to-date knowledge and clinical performance, which decline.	The disparity between our diagnostic skills and clinical judgment, which increase with experience, and our up-to-date knowledge and clinical performance which decline	Introduction	Implicitly
1.03	Association is not the same as causation	An 'outcome' may be associated with a treatment, but not caused by the treatment.	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research	Recognize that association does not imply causation, and explain why.	Understanding that association does not imply causation and why (e.g. reverse causation, confounding) is also important.	Appraise	Explicitly
1.04	Common practice is not always evidence-based	Widely used treatments or treatments that have been used for a long time are not necessarily beneficial or safe	Know the rationale and origin of EBP.	Recognise the gaps between evidence and practice leading to variations in practice and quality of care.	The gaps between evidence and practice (including overuse and underuse of evidence) leading to variations in practice and quality of care	Introduction	Explicitly
1.05	Newer is not necessarily better	New, brand-named, or more expensive treatments may not be better than available alternatives	Know the rationale and origin of EBP.	-	In this concept, learner needs to know the rationale and origin of EBP, including that daily clinical need for valid and quantitative information about diagnosis (e.g. knowing that earlier diagnosis doesn't mean better), prognosis, therapy (e.g. new interventions aren't necessarily better than current alternatives)	Introduction	Explicitly

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1.06	Expert opinion is not always right	Opinions of experts or authorities do not alone provide a reliable basis for deciding on the benefits and harms of treatments	Know the rationale and origin of EBP.	Be aware of the inadequacy of traditional sources for this information.	The inadequacy of traditional sources for this information because they are out of date (traditional textbooks), frequently biased (experts)	Introduction	Explicitly
1.07	Beware of conflicting interests	Conflicting interests may result in misleading claims about the effects of treatments.	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research	Know the importance of considering conflict of interest/funding sources when appraising articles.	Know the importance of considering conflict of interest/funding sources when appraising articles.	Appraise	Explicitly
1.08	More is not necessarily better	Increasing the amount of a treatment does not necessarily increase the benefits of a treatment and may cause harm.	Explain the use of harm/aetiologies study for (rare) adverse effects of interventions.	Common treatment harms can usually be observed in controlled trials, but some rare or late harms will only be seen in observational studies.	While critical appraisal of such studies is not a core skill, learner needs to indicate when and why they are needed. Also, learners need to recognise that treatment may be harmful and increasing the amount of an effective treatment does not necessarily increase the benefits of a treatment and may cause harm	Appraise	Explicitly
1.09	Earlier is not necessarily better	Earlier detection of disease is not necessarily better.	Know the rationale and origin of EBP.	-	In this concept, learner needs to know the rationale and origin of EBP, including that daily clinical need for valid and quantitative information about diagnosis (e.g. knowing that earlier diagnosis doesn't mean better), prognosis, therapy (e.g. new interventions aren't necessarily better than current alternatives	Introduction	Explicitly
1.10	Hope may lead to unrealistic expectations	Hope or fear can lead to unrealistic expectations about the effects of treatments.	Engage patients in the decision making process, using shared decision making, including discussing the evidence and their preferences		In this concept, learner needs to be able to engage the patients in the decision making process, to communicate benefit and harms to patients, and to be aware of the role of decision support tools such as patient decision aids in shared decision making	Apply	Implicitly

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1.10	Hope may lead to unrealistic expectations	Hope or fear can lead to unrealistic expectations about the effects of treatments.	Understand evidence-based practice (EBP) defined as the integration of the best research evidence with our clinical expertise and our patient's unique values and circumstances.		Patient values and circumstances (i.e. the unique preferences, concerns and expectations each patient brings to a clinical encounter and which must be integrated into shared clinical decisions if they are to serve the patient; and their individual clinical state and the clinical setting.	Introduction	Implicitly
1.11	Explanations about how treatments work can be wrong	Beliefs about how treatments work are not reliable predictors of the actual effects of treatments	Know the rationale and origin of EBP.	Recognise the distinction between the pathophysiological and empirical approach of dealing with what is effective.	The distinction between the pathophysiological vs. empirical approach of dealing with what is effective (e.g. Dr. Spock's advice to put infants on fronts to sleep to avoid choking on vomit [pathophysiological] while this led to avoidable cot death [empirical]	Introduction	Explicitly
1.12	Dramatic treatment effects are rare	Large, dramatic effects of treatments are rare.	Identify the preferred order of study designs for each type of clinical question, including the pros and cons of the major study designs		In this competence, learner needs to identify the preferred order of study designs for each type of clinical question (e.g. treatment question best to be answered by a systematic review of randomised controlled trials), including the pros and cons of the major study designs – importantly those of highest level of evidence (e.g. systematic reviews, RCTs). Also, the learner needs to recognise when RCTs are unnecessary – such as in case of large, dramatic effects of intervention "all or none"	Introduction	Explicitly
2.01	Evaluating the effects of treatments requires appropriate comparisons	Evaluating the effects of treatments requires appropriate comparisons.	Understand the preferred order of study designs for each type of clinical question, including the pros and cons of the major study designs	Understand and be able to identify the major study designs for each type of research question.	In this concept, learner needs to understand the preferred order of study designs for each type of clinical question (e.g. treatment question best to be answered by a systematic review of randomised controlled trials), including the pros and cons of the major study designs – importantly those of highest level of evidence (e.g. systematic reviews, RCTs)	Introduction	Explicitly
2.01	Comparison groups should be similar	Apart from the treatments being compared, the comparison groups need to be similar (i.e. 'like needs to be compared with like').	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Understand the different types of bias.	In this concept, learner needs to understand key concepts relevant to the critical evaluation of the integrity, reliability, and applicability of health related research which requires an understanding of the different sources and types of bias (such as 'allocation bias')	Appraise	Explicitly

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2.02	Comparison groups should be similar	Apart from the treatments being compared, the comparison groups need to be similar (i.e. 'like needs to be compared with like').	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial) which requires being able to identify and appraise key features of a controlled trial (such as 'randomisation')	Appraise	Explicitly
2.03	Peoples' outcomes should be analysed in their original groups	People's outcomes should be counted in the group to which they were allocated.	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial), which requires being able to identify and appraise key features of a controlled trial (such as 'Intention-To-Treat analysis' vs. 'Per Protocol analysis'.	Appraise	Explicitly
2.04	Comparison groups should be treated equally	People in the groups being compared need to be cared for similarly (apart from the treatments being compared)	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial) which requires being able to identify and appraise key features of a controlled trial (such as 'Performance bias')	Appraise	Explicitly
2.05	People should not know which treatment they get	If possible, people should not know which of the treatments being compared they are receiving.	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial) which requires being able to identify and appraise key features of a controlled trial (such as 'allocation concealment' and 'blinding')	Appraise	Explicitly
2.06	Peoples' outcomes should be assessed similarly	Outcomes should be measured in the same way (fairly) in the treatment groups being compared.	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Understand the different types of bias.	In this concept, learner needs to understand key concepts relevant to the critical evaluation of the integrity, reliability, and applicability of health related research which requires an understanding of the different sources and types of bias (such as 'measurement and detection bias')	Appraise	Explicitly

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2.06	Peoples' outcomes should be assessed similarly	Outcomes should be measured in the same way (fairly) in the treatment groups being compared.	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	[In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial) which requires being able to identify and appraise key features of a controlled trial (such as 'randomisation and allocation concealment', 'blinding', 'loss to follow up/attrition bias', and 'Intention-To-Treat analysis' vs. 'Per Protocol analysis'	Appraise	Implicitly
2.07	All should be followed up	It is important to measure outcomes in everyone who was included in the treatment groups	Critically appraise and interpret a treatment study	Able to identify and appraise key features of a controlled trial	In this concept, learner needs to be able to critically appraise a treatment study (such as a randomized controlled trial) which requires being able to identify and appraise key features of a controlled trial (such as 'loss to follow up /attrition bias')	Appraise	Explicitly
2.08	Consider all of the relevant fair comparisons	The results of single comparisons of treatments can be misleading	Critically appraise and interpret a systematic review	Know the difference between systematic reviews, meta-analyses, and non-systematic reviews.	-	Appraise	Implicitly
2.08	Consider all of the relevant fair comparisons	The results of single comparisons of treatments can be misleading	Critically appraise and interpret a systematic review	Able to identify and critically evaluate key elements of a systematic review.	In this concept, learner needs to be able to critically appraise a systematic review which requires being able to identify and assess the key elements of a systematic review such as the search strategy, the appraisal and selection of studies, and the synthesis and summary of findings (including a Summary of Findings table) and how these elements differ from a traditional review	Appraise	Implicitly
2.09	Reviews of fair comparisons should be systematic	Reviews of treatment comparisons that do not use systematic methods can be misleading	Critically appraise and interpret a systematic review	Able to identify and critically evaluate key elements of a systematic review.	In this concept, learner needs to be able to critically appraise a systematic review which requires being able to identify and assess the key elements of a systematic review such as the search strategy, the appraisal and selection of studies, and the synthesis and summary of findings (including a Summary of Findings table) and how these elements differ from a traditional review	Appraise	Explicitly

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2.10	All fair comparisons and outcomes should be reported	Unpublished results of fair comparisons may result in biased estimates of treatment effects	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Understand the different types of bias.	In this concept, learner needs to understand key concepts relevant to the critical evaluation of the integrity, reliability, and applicability of health related research which requires an understanding of the different sources and types of bias (such as 'selection bias', 'confounding', 'allocation bias', 'measurement and detection bias', and 'reporting and publication bias'), and the impact of these biases and uncertainty (random error) on estimates from studies	Appraise	Explicitly
2.11	Subgroup analyses may be misleading	Results for a selected group of people within a systematic review of fair comparisons of treatments can be misleading.	Interpret different types of measures of association and effect, including key graphical presentations	Recognise use and limitations subgroup and sensitivity analysis, and how they help the interpretation of results.	Since subgroup and sensitivity analysis are commonly reporting, their meaning and limitations should be known.	Appraise	Explicitly
2.12	Relative measures of effects can be misleading	Relative effects of treatments alone can be misleading	Explain the importance of baseline risk of individual patients when estimating individual expected benefit.	-	In this concept, learner needs to understand the importance of baseline risk of individual patients when estimating individual expected benefit, and its role in engaging the patients in decision-making process (e.g. balance benefits and harms of a treatment).	Apply	Implicitly
2.12	Relative measures of effects can be misleading	Relative effects of treatments alone can be misleading	Critically appraise and interpret a treatment study.	Interpret the results including measures of effect	Interpreting the results requires being able to interpret the common measures of effect (such as odds ratio, relative risk reduction/increase, absolute risk difference, relative risk /risk ratio, hazard ratio, NNT/NNH)	Appraise	Implicitly
2.13	Average measures of effects can be misleading	Average differences between treatments can be misleading	Explain the importance of baseline risk of individual patients when estimating individual expected benefit.	-	In this concept, learner needs to understand the importance of baseline risk of individual patients when estimating individual expected benefit (average measures of effects can be misleading), and its role in engaging the patients in decision-making process (e.g. balance benefits and harms of a treatment).	Apply	Explicitly

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2.14	Fair comparisons with few people or outcome events can be misleading	Small studies in which few outcome events occur are usually not informative and the results may be misleading	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Interpret commonly used measures of uncertainty, such as confidence intervals and p-values.	-	Appraise	Implicitly
2.14	Fair comparisons with few people or outcome events can be misleading	Small studies in which few outcome events occur are usually not informative and the results may be misleading	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Understand the difference between random error and systematic error (Bias).	-	Appraise	Implicitly
2.15	Confidence intervals should be reported	The use of p-values to indicate the probability of something having occurred by chance may be misleading; confidence intervals are more informative	Critically appraise and interpret a treatment study.	Interpret the results including measures of effect	Interpreting the results requires being able to interpret the common measures of effect (such as odds ratio, relative risk reduction/increase, absolute risk difference, relative risk /risk ratio, hazard ratio, NNT/NNH) and measures of uncertainty (confidence intervals and p-values).	Appraise	Explicitly
2.15	Confidence intervals should be reported	The use of p-values to indicate the probability of something having occurred by chance may be misleading; confidence intervals are more informative	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Interpret commonly used measures of uncertainty, such as confidence intervals and p-values.	Knowledge of statistical calculations is not required, but the ability to interpret statistical results, such as confidence intervals and p-values, is essential	Appraise	Explicitly
2.16	Don't confuse "statistical significance" with "importance"	Saying that a difference is statistically significant or that it is not statistically significant can be misleading	Interpret different types of measures of association and effect, including key graphical presentations	Identify the difference between "statistical significance" and "importance", and between a lack of evidence of an effect and 'evidence of no effect'.	Understand the difference between statistical and clinical significance.	Appraise	Explicitly

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2.17	Don't confuse "no evidence" with "no effect"	A lack of evidence is not the same as evidence of “no difference”	Interpret different types of measures of association and effect, including key graphical presentations	Identify the difference between "statistical significance" and "importance", and between a lack of evidence of an effect and ‘evidence of no effect’.			Explicitly
3.01	Do the outcomes measured matter to you?	A systematic review of fair comparisons of treatments should measure outcomes that are important	Explain the importance of baseline risk of individual patients when estimating individual expected benefit.	Recognise the different types of outcome measures (surrogate vs. composite end points measures).	In addition, learners need to know the different types of outcome measures and to identify the most important to the patients (e.g. patients related outcomes are more relevant to the patients than surrogate outcomes)	Apply	Explicitly
3.02	Are you very different from the people studied?	A systematic review of fair comparisons of treatments in animals or highly selected groups of people may not be relevant	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	Understand the different types of bias.	In this concept, learner needs to understand key concepts relevant to the critical evaluation of the integrity, reliability, and applicability of health related research which requires an understanding of the different sources and types of bias (such as ‘selection bias’)	Appraise	Explicitly
3.02	Are you very different from the people studied?	A systematic review of fair comparisons of treatments in animals or highly selected groups of people may not be relevant	Practice the 5 steps of EBP: Ask, Acquire, Appraise and Interpret, Apply, and Reflect.	-	Critically appraising that evidence for its validity, impact, and applicability	Introduction	Implicitly
3.03	Are the treatments practical in your setting?	The treatments evaluated in fair comparisons may not be relevant or applicable	Understand evidence-based practice (EBP) defined as the integration of the best research evidence with our clinical expertise and our patient’s unique values and circumstances.	-	Patient values and circumstances (i.e. the unique preferences, concerns and expectations each patient brings to a clinical encounter and which must be integrated into shared clinical decisions if they are to serve the patient; and their individual clinical state and the clinical setting.	Introduction	Implicitly

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3.03	Are the treatments practical in your setting?	The treatments evaluated in fair comparisons may not be relevant or applicable	Identify key competencies relevant to the critical evaluation of the integrity, reliability, and applicability of health-related research.	-	In this concept, learner needs to understand key concepts relevant to the critical evaluation of the integrity, reliability, and applicability of health related research	Appraise	Implicitly
3.04	How certain is the evidence?	Well-conducted systematic reviews often reveal a lack of relevant evidence, but they provide the best basis for making judgements about the certainty of the evidence.	Critically appraise and interpret a systematic review	-	Such appraisal skills should be able to conclude with the "Level of evidence" resulting from a systematic review, e.g. using Grading of Recommendations Assessment, Development and Evaluation (GRADE).	Appraise	Explicitly
3.04	How certain is the evidence?	Well-conducted systematic reviews often reveal a lack of relevant evidence, but they provide the best basis for making judgements about the certainty of the evidence.	Interpret the grading of the certainty in evidence and the strength of recommendations in health care	-	In this concept, learner needs to understand and consider key factors drive the direction and strength of the recommendations, and its role in shared decision making (e.g. weak recommendations are usually sensitive to the patients' values and preferences)	Apply	Explicitly
3.05	Do the advantages outweigh the disadvantages?	Decisions about treatments should not be based on considering only their benefits	Explain the importance of baseline risk of individual patients when estimating individual expected benefit.	-	In this concept, learner needs to understand the importance of baseline risk of individual patients when estimating individual expected benefit, and its role in engaging the patients in decision-making process (e.g. balance benefits and harms of a treatment).	Apply	Explicitly
3.05	Do the advantages outweigh the disadvantages?	Decisions about treatments should not be based on considering only their benefits	Interpret the grading of the certainty in evidence and the strength of recommendations in health care	-	In this concept, learner needs to understand and consider key factors drive the direction and strength of the recommendations, and its role in shared decision making (e.g. weak evidence recommendations are usually sensitive to the patients' values and preferences)	Apply	Explicitly