The DE-imFAR de-implementation strategies

1. Strategy - *Non-reflective decision assistance strategy*

Support for clinical decision-making on the primary prevention of cardiovascular disease (CVD) in low cardiovascular risk (CVR) patients integrated into the electronic health record (EHR) of the Basque Health Service (Osakidetza), based on pop-up reminders and alerts, together with an interactive media-based algorithm stating the recommended practice and a patient information sheet.

1.1. Target audience

This strategy targets all family phyisicians (FPs) from all 13 Integrated Healthcare Organizations (IHOs) of the Basque Health Service (Osakidetza), both in primary and specialist or hospital care.

1.2. Active components (actions) of the intervention

- "Lighthouse" guiding alert in the REGICOR CVR calculator. Reminders of recommended clinical practice in the primary prevention of CVD that pop-up in the REGICOR CVR calculator when the CVR is estimated in patients aged between 35 and 74 years old. The alert varies depending on the CVR score (<10% or ≥10%).

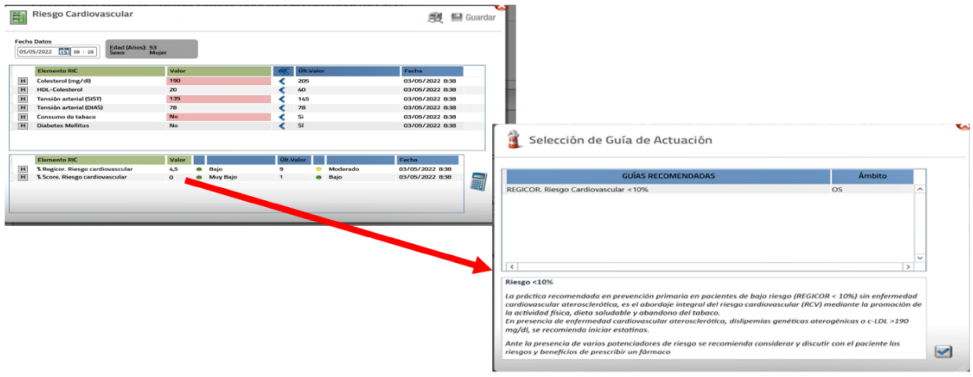

Figure 1. Pop-up reminder ("Lighthouse" guiding alert) in the REGICOR cardiovascular risk calculator when estimated cardiovascular risk score is <10%.

- Alerts in PRESBIDE. Pop-up reminders that appear when the PRESBIDE software is used to prescribe statins. There are three types of alerts depending on the patient's age group (<35, 35-74, and ≥75 years old). Further, links are providedto a decision-making algorithm and a patient information sheet (i-botika).
- Decision-making algorithm: "Management of cholesterol as a risk factor in primary prevention of cardiovascular disease". Clinical decision tree presenting potential courses of action based on clinical practice guidelines (CPGs), specifically for reducing cholesterol for the primary prevention of CVD in patients of different age groups and levels of CVR. Interactive decision-making support tool, developed by researchers collaborating in the DE-imFAR project, that also includes links for downloading two further documents: one providing information on CVD risk factors and the other on the 5As "Ask, Assess, Advise, Assist, Arrange" clinical intervention, recommended for promoting healthy lifestyles.

- Patient information sheet on cholesterol levels (i-botika: "Cholesterol levels are not the only thing", developed in the framework of this project, providing information on high cholesterol levels and their role together with other risk factors associated with CVD)

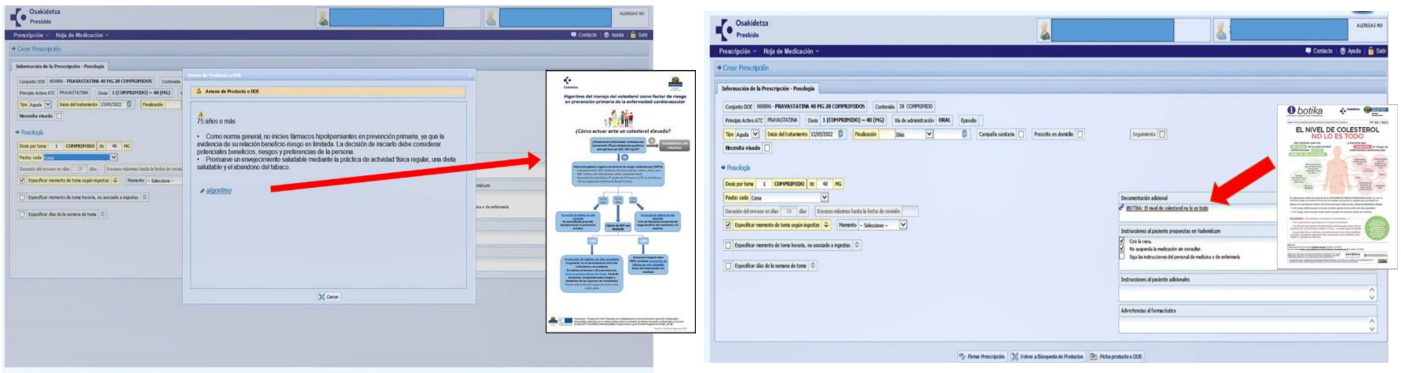

Figure 2. a). Pop-up reminder in the PRESBIDE software with recommendations on the prescribing of statins in people ≥75 years old that includes a link to the "Management of cholesterol as a risk factor in primary prevention of cardiovascular disease" algorithm, b) PRESBIDE form for prescribing statins, with a link to the patient information sheet (i-botika).

1.3. Objectives: *Determinant - What needs to change*

Pop-up alerts, reminders, and an algorithm

Cognitive and interpersonal skills:

✓ Enhance skills to enable appropriate prescribing of statins based on clinical practice recommendations

Attention, memory, and decision-making processes:

✓ Promote recall of recommended clinical practice in the primary prevention of CVD, reducing the impact of therapeutic inertia

Context and resources:

✓ Develop support systems in the EHR as reminders of and to promote the practices recommended in CPGs for the primary prevention of CVD (avoiding statins and encouraging healthy lifestyles)

✓ Restrict or impede inappropriate prescribing of statins due to clinical prescribing behavior driven by simplicity and speed

Emotion/Reinforcement:

✓ Reduce the likelihood of inappropriate prescribing due to habit, routine, or inertia (to "treat" cholesterol), through the experiencing of negative emotions when going against the recommended practice and this is made evident by alerts

Patient information sheet

Social influence (patient involvement):

✓ Increase patient awareness of the problems associated with the inappropriate prescribing of statins: risks vs benefits

✓ Increase patient knowledge of the criteria and courses of action recommended in CPGs (concerning cholesterol, CVD, and CVR)

1.4. Choice architecture techniques

A. Decision Information

A1. Translate information: change the format or presentation of information but not the content.

Reframe: present the (same) information in several ways, e.g., Presenting the contents of CPGs in several different ways (i.e., text within alerts, in the form of an algorithm, etc.).

Simplify: reduce the burden of cognitive effort necessary to process the information available and increase its usefulness in the decision-making process, e.g., algorithm.

A2. Make information visible: make necessary information readily accessible.

Make external information visible: make decision-relevant information visible, e.g., text within alerts recalling the CPGs.

B. Decision structure

B1. Change choice defaults

Prompted choice: avoid the status quo bias or default effects because of inertia or assumed recommendations, e.g., pop-up alerts.

B2. Change option-related effort: change physical effort.

Increase physical effort: e.g., pop-up alerts.

C. Decision assistance

C1. Provide reminders: provide positive reminders that heighten the salience of a desired option and/or diminish the salience of an undesired option, e.g., Pop-up alerts with the recommendation to not prescribe statins.

1.5. Exposure

- "Lighthouse" guiding alert in the REGICOR CVR calculator: by clicking to "save" the result after estimating CVR
- Alerts in PRESBIDE: by starting to prescribe statins or clicking on the links to the algorithm or the patient information sheet

2. Strategy - *Reflective/non-reflective decision information strategy*

Corporate campaign entitled "Stopping low-value prescribing" (in Spanish: "*Abandono de prescripciones farmacológicas de escaso valor*"), promoted through a knowledge dissemination strategy based on circulars and notifications (e.g., mass mailing and internal newsletters) concerning content, informative material and documents on recommended clinical practice and improving the appropriateness and/or optimization in prescribing drug treatments, including that of statins for the primary prevention of CVD, made available to FPs on the corporate intranets of the Ezkerraldea-Enkarterri-Cruces (EEC) and Barakaldo-Sestao (BS) IHOs, part of the Basque Health Service (Osakidetza).

2.1. Target audience

This strategy targets all FPs from the EEC and BS IHOs, who will also be exposed to the first strategy, namely, non-reflective decision assistance.

2.2. Active components (actions) of the intervention

- Adherence to and implementation of best practice pages on the EEC and BS IHO intranets which have dedicated sections focused on improving the appropriateness of the use of statins providing easy access to the CPGs and recommended practice for the primary prevention of CVD.

Figure 3. Main page of the adherence to and implementation of best practice ("A*decuación e Implementación de Buenas Prácticas*") section on the Ezkerraldea-Enkarterri-Cruces Integrated Healthcare Organization intranet and main page of the dedicated "Stopping inappropriate prescribing of statins for the primary prevention of cardiovascular disease" section. Equivalent pages were also created on the Barakaldo-Sestao Integrated Healthcare Organization intranet.

- Corporate dissemination campaign: activities aimed at attracting FPs to the pages created on the EEC and BS IHO intranets, in order that they access the information and documents available
  - News story on the launch of the campaign with links to the pages on the corporate intranets, e.g.,

Figure 4. News story published on the Ezkerraldea-Enkarterri-Cruces Integrated Healthcare Organization intranet to announce the launch of the corporate "Stopping low-value prescribing" campaign and the development of pages on its intranet and that of the Barakaldo-Sestao Integrated Healthcare Organization, on May 5, 2022. The story was also published on the Barakaldo-Sestao Integrated Healthcare Organization intranet.

- Monthly newsletter: reporting of the launch of the campaign in the monthly newsletter circulated by the BS IHO to all its employees
- Mass mailing on the launch of the campaign with links to the pages on the corporate intranets
- Revitalization of the corporate campaign: periodic publication of news stories on the EEC and BS IHO intranets with content related to the campaign informing FPsof the updating of content/informative materials (for example, any changes in the recommendations in CPGs and INFAC [pharmacotherapy information] newsletters) on the dedicated pages on the intranets of both IHOs, aimed at improving the appropriateness of the use of statins in primary prevention of CVD, including links to these pages.

- Justification email from the Healthcare Management of the Basque Health Service, telling all FPs about the initiatives being put in place to improve the approach to the prevention of CVD, improving the appropriateness of statin prescribing, and encouraging the provision of healthy lifestyle advice, among other components.

2.3. Objectives: Determinant - *What needs to change*

Knowledge:

- ✓ Increase awareness of the problem of the inappropriate prescribing of statins
- ✓ Increase knowledge of the CPGs on the primary prevention of CVD, in particular, the appropriate or recommended care as a function of the estimated CVR
- ✓ Provide evidence-based standardized and up-to-date clinical guidelines

Behavior regulation:

- ✓ Encourage reflection on practice/performance in relation to inappropriate prescribing of statins in the primary prevention of CVD

Beliefs about capabilities:

- ✓ Strengthen the belief that the prescribing of statins is not as straightforward and safe as might be thought
- ✓ Strengthen the belief that statin treatment is not easy for patients (dosage)

Beliefs about consequences:

- ✓ Strengthen the belief that not prescribing statins for the primary prevention of CVD is not the same as "not treating".
- ✓ Strengthen the belief that statins are not more effective in reducing cardiovascular events than healthy lifestyle promotion in the primary prevention of CVD
- ✓ Strengthen the belief that statins, in the primary prevention of CVD, may have adverse effects and are not risk-free.

Professional/social role and identity:

- ✓ Foster the belief that appropriate primary prevention of CVD is considered important at the organizational level and among peers.
- ✓ Strengthen understanding that the role of FPs goes beyond that of prescribing drugs.

Social influence:

- ✓ Increase awareness of the organizational goals for reducing inappropriate prescribing of statins in the primary prevention of CVD.
- ✓ Increase patient awareness of the problems associated with the inappropriate prescribing of statins: risks vs benefits
- ✓ Increase patient knowledge of the criteria and recommended courses of action (concerning cholesterol, CVD, and CVR)

Emotion/reinforcement:

- ✓ Reduce the likelihood of inappropriate prescribing due to habit, routine, or inertia (to "treat" cholesterol), through the experiencing of negative emotions when going against the recommended clinical practice and this is made evident by alerts.

Cognitive and interpersonal skills:

- ✓ Enhance skills to enable the appropriate prescribing of statins based on CPGs.

2.4. Choice architecture techniques

A. Decision Information

A1. Translate Information: change the format or presentation of information but not the content.

Reframe: present the (same) information in several ways, e.g., clinical guidelines, algorithm, patient information leaflet.

Simplify: reduce the burden of cognitive effort necessary to process the information available and increase its usefulness in the decision-making process, e.g., algorithm.

A2. Make information visible: make necessary information readily accessible.

Make external information visible: make decision-relevant information visible, e.g., Links about inappropriate statin prescription in the Basque Health Service (Osakidetza), adverse effects of statins and cholesterol treatment, and promotion of the campaign through emails and news.

A3. Provide social reference point: influence decision-making through other's behavior.

Refer to descriptive norm: depict the observable behavior of other people to impact on the decision-making process, e.g., links about inappropriate statin prescription in the Basque Health Service (Osakidetza).

Refer to opinion leader: use them as information disseminators to improve the impact of the campaign, e.g., Setting of goals in an email sent by an opinion leader, using the source as much as the content of the message to improve the impact of the campaign.

B. Decision structure

B2. Change option-related effort: modify the physical or financial effort involved in the decision-making process.

Change physical effort, e.g., decreasing physical effort by making all theme-related information accessible on the same website and including links to the website in the text of emails and news stories.

C. <u>Decision assistance</u>

C1. Provide reminders: provide positive reminders that heighten the salience of a desired option and/or diminish the salience of an undesired option, e.g., links to clinical guidelines with recommended practice about CVD primary prevention, and information about adverse effects of statins.

2.5. Exposure

- By accessing the pages of the EEC and BS IHO corporate intranet and clicking on the links to the CPGs, INFAC newsletters, i-botika patient information sheets, recommendations, etc. available in the dedicated "Stopping inappropriate prescribing of statins for the primary prevention of cardiovascular disease" section
- By accessing the news section on the dedicated pages on the intranets of EEC and BS IHOs

3. Strategy - *Reflective decision structure strategy*

Sending of regular personalized *Audit & Feedback (A&F)* reports with practice- and organizational-level performance indicators of the FPsregarding inappropriate prescribing of statins and healthy lifestyle promotion in the primary prevention of CVD in low-risk patients in the Basque Health Service

3.1. Target audience

This strategy targets a randomly selected set of FPs from the EEC and BS IHOs, who will also be exposed to the previously described interventions, namely, *non-reflective decision assistance and decision information*.

3.2. Active components (actions) of the intervention

- Informative email concerning the sending of A&F reports, including the possibility to opt out: email with information for primary care FPs of the EEC and BS IHOs on the sending of regular personalized A&F reports, in the framework of the corporate campaign, with the goal of encouraging adherence to recommendations and stopping inappropriate prescribing of statins

- A&F reports mailing: periodic A&F reports with indicators describing global performance across the Basque Health Service: a) rate of new potentially inappropriate prescribing of statins to people without CVD and with REGICOR CVR scores <7.5% and practice in the promotion of healthy habits in these patients; b) rate of documentation of CVR (in the 2 years before the prescription date) in all 40- to 75-year-olds with no clinical history of CVR who are newly prescribed statins. Future A&F reports are expected to contain a link to a short voluntary exercise on goal setting for improving the appropriateness of statin prescribing for the primary prevention of CVD

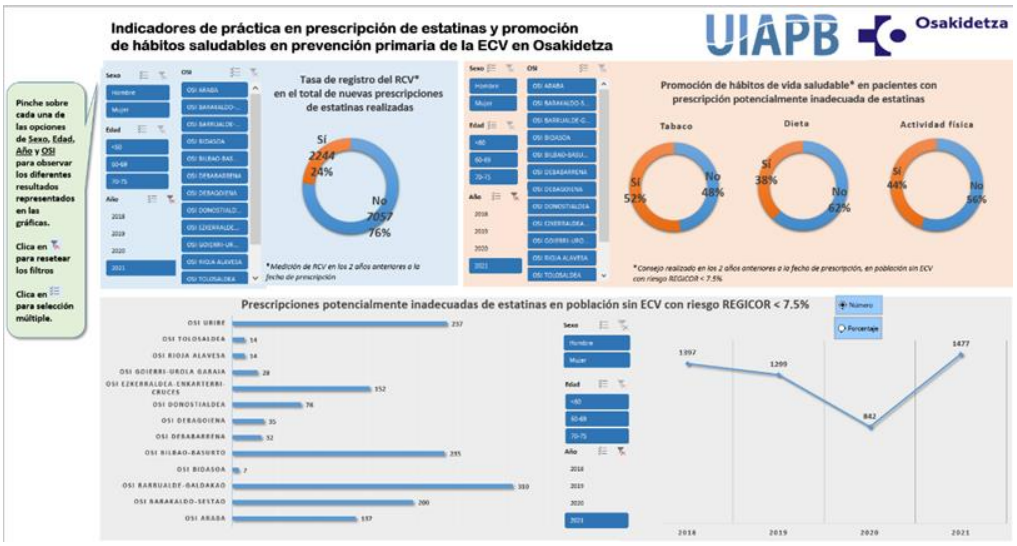

Figure 5. Draft of the Audit & Feedback report with practice- and organizational-level performance indicators of the family physicians regarding inappropriate prescribing of statins and healthy lifestyle promotion in the primary prevention of cardiovascular disease in low-risk patients in the Basque Health Service

3.3. Objectives: Determinant - What needs to change

Knowledge:

- ✓ Increase awareness of the problem of the inappropriate prescribing of statins

Behavior regulation:

- ✓ Make data available on inappropriate prescribing of statins for the primary prevention of CVD
- ✓ Provide tools for the setting of clear specific goals, at personal and organizational levels, regarding the reduction of inappropriate prescribing of statins for the primary prevention of CVD

Active reflection on personal practice:

- ✓ Encourage further reflection on practice/performance in relation to inappropriate prescribing of statins for the primary prevention of CVD

Intentions:

- ✓ Reduce the intention to prescribe statins inappropriately and increase the intention to promote healthy lifestyles for the primary prevention of CVD

Goals:

- ✓ Encourage commitment to practice in the primary prevention of CVD that is in accordance with recommendations
- ✓ Increase the motivation to promote healthy lifestyles in the primary prevention of CVD

Beliefs about capabilities:

- ✓ Strengthen self-efficacy and enhance the skills required for promoting healthy lifestyles

Emotion:

- ✓ Strengthen self-confidence about not prescribing statins for the primary prevention of CVD
- ✓ Foster belief in the safety of and trust in the courses of action recommended in the guidelines
- ✓ Experience a negative emotion after inappropriate prescribing

Professional/social role and identity:

- ✓ Foster the belief that appropriate primary prevention of CVD is considered important at the organizational level and among peers
- ✓ Strengthen understanding that the role of FPs goes beyond prescribing drugs

Reinforcement:

- ✓ Generate positive/negative reinforcement related to good/poor performance in the primary prevention of CVD.

3.4. Choice architecture techniques

A. Decision Information

A1. Translate Information: change the format or presentation of information but not the content.

Simplify: reduce the burden of cognitive effort necessary to process the information available and increase its usefulness in the decision-making process, e.g., presenting prescription rate data in a simple, user-friendly way, namely, on a dashboard.

A2. Make information visible: make necessary information readily accessible.

Make own behavior visible: feedback.

Make external information visible: make decision-relevant information visible, e.g., showing the prescription rates of other FPs and other IHOs.

A3. Provide social reference point: influence decision-making through the behavior of others.

Refer to descriptive norm: depict the observable behavior of other people to impact on the decision-making process, e.g., showing other FPs' prescribing behavior.

B. Decision structure

B2. Change opinion-related effort: modify the physical or financial effort involved in the decision-making process.

Decrease physical effort: collect all prescribing data in one file, e.g., dashboard.

C. Decision assistance

C2. Facilitate commitment: overcome constrained self-control and bridge the intention-behavior gap.

Support self-commitment: arrange with the aim of helping fulfill a plan, e.g., self-commitment questionnaire

3.5. Exposure

By opening the A&F reports received by email.

Annex I. GLOSSARY OF TERMS

1. De-implementation: De-implementation is defined as the process of reducing or abandoning the use of guidelines practices, interventions or policies that are found to be ineffective, are not proven to be effective, do not have adecuated scientific support, are less effective or less cost-effective than an alternative one, are potentially harmful to patients, or that represent low-value care.

2. Implementation: Implementation (commonly defined as "to do"), in the context of Implementation Science refers to the actively designed process of putting into practice or integrating evidence-based interventions (e.g., practice, program, policy,...) within a specific real-world setting.

3. Theoretical Domains Framework (TDF): The Theoretical Domains Framework (TDF) is an integrative framework developed from a synthesis of psychological theories as a vehicle to help apply theoretical approaches to interventions aimed at behavior change. The TDF comprises of 14 domains and 84 constructs that allows synthesis of a multitude of coherent behavior change theories into a single framework that allows assessment and explanation of behavioral problems and associated barriers and enablers, and inform the design of appropriately targeted interventions.

References:

1. Michie S, Johnston M, Abraham C, et al. Making psychological theory useful for implementing evidence based practice: a consensus approach. Qual Saf Health Care. 2005;14(1):26-33. doi:10.1136/qshc.2004.011155.
2. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci. 2012;7:37. doi:10.1186/1748-5908-7-37.
3. Atkins L, Francis J, Islam R, et al. A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. Implement Sci. 2017;12(1):77. doi: 10.1186/s13012-017-0605-9.

4. Behavior Change Wheel (BCW): The Behavior Change Wheel (BCW) is a theory- and evidence-based tool that provides a process for designing or refining behavior change interventions and policies. Its purpose is to promote a systematic and comprehensive analysis of behavior in its context to guide change. It can be used to identify the interventions and policies likely to be effective in changing behavior.

Reference:

1. Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. Implement Sci. 2011 23;6:42. Published 2011 Apr 23. doi:10.1186/1748-5908-6-42.

5. Statin: Statins, also known as HMG-CoA reductase inhibitors, are a class of lipid-lowering medications that are used to lower blood low-density lipoprotein (LDL) cholesterol levels.

6. Non-reflective: Non-reflective processes, such as habits and routines, are defined as those factors that bypass conscious deliberation and so generate actions fast, effortlessly, automatically and with little deliberation and awareness.

7. Reflective: Reflective processes involves conscious deliberation over situational demands, available options and/or outcome expectancies; and therefore generate slow and effortful actions or behaviors via reasoned intentions.

8. Decision assistance strategy. Decision information strategy. Decision structure strategy
According to the taxonomy suggested by Münscher et al., there are three broad categories of choice architecture intervention techniques: decision information, decision structure, and decision assistance (Münscher et al., 2016).

i) **Decision information** interventions aim to facilitate access to decision-relevant information without altering the options themselves by increasing its availability, comprehensibility, and/or personal relevance to the decision maker. There are several ways of achieving it, such as (re)arranging existing information or changing its presentation/format, providing social reference point, etc.
ii) **Decision structure** interventions target the way in which the choice options are organized and structured through the arrangement of choice alternatives and the format of decision making, which includes setting default options, rearranging their composition, and changing option-related efforts or consequences of selecting it.
iii) **Decision assistance** interventions aim to bridge the intention–behavior gap by reinforcing self-regulation by providing decision makers with further assistance to help them follow through with their intentions. To do so, examples of decision assistance interventions techniques include provision of reminders of the desirable behavioral option as well as facilitating deliberate commitment to beneficial actions.

References:
1. Münscher R, Vetter M, Scheuerle T. A review and taxonomy of choice architecture techniques. J Behav Decis Mak. 2016;29(5):511-24. doi.org/10.1002/bdm.1897.
2. Mertens S, Herberz M, Hahnel UJJ, Brosch T. The effectiveness of nudging: A meta-analysis of choice architecture interventions across behavioral domains. Proc Natl Acad Sci USA. 2022;119(1):e2107346118. doi: 10.1073/pnas.2107346118. Erratum in: Proc Natl Acad Sci USA. 2022;119(19):e2204059119.

9. Audit & feedback (A&F): Audit and feedback is a strategy that aims to encourage individuals to change their practice and improve their performance. In the audit process, an individual's professional practice or performance is assessed and monitored based on specific, pre-defined criteria or standards. Then, the results of the comparison is fed back to the individual in a structured manner.