Federatie
Medisch
Specialisten

The implementation of AL-assisted literature screening in developing and updating medical guidelines at the Knowledge Institute

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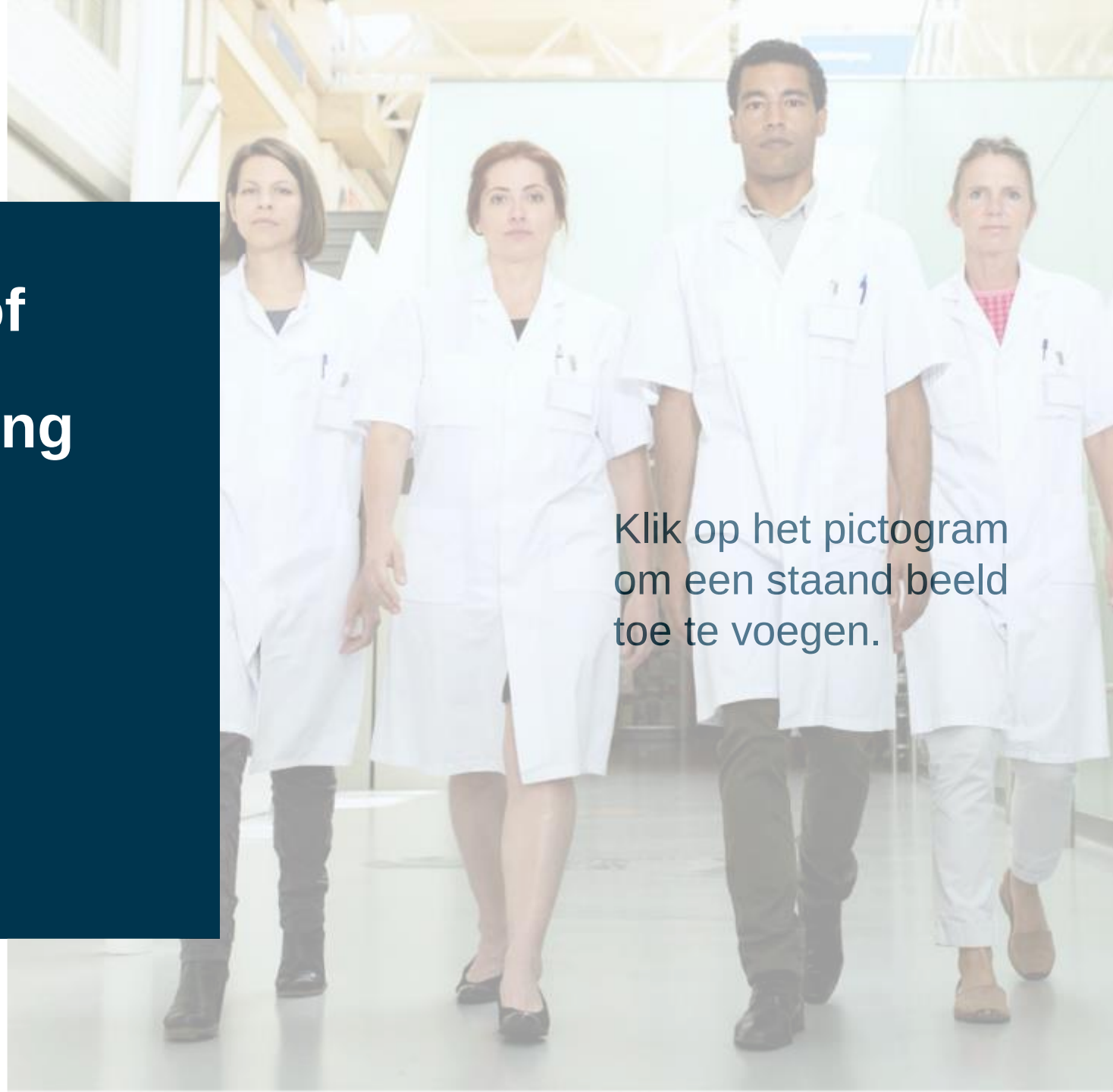


Scenarios

- Process optimalisation of manual selection of literature by medical specialists
  - AI techniques are available to aid guideline developers (medical specialists and guideline consultants) in selecting relevant literature
- Process change: Modular updates of guideline modules
  - Most guidelines will be updated in a novel process, not newly developed
  - With updates, prior knowledge is available, and maybe the re-use of literature searches

Aims

- The aim for the medical specialist is: to have access to guidelines that are based on the latest and most relevant literature, and as a working group member to not waste my time screening large numbers of irrelevant abstracts

- The aim for the guideline developer is to select the most relevant literature in the most time-efficient way, and to plan the work accordingly

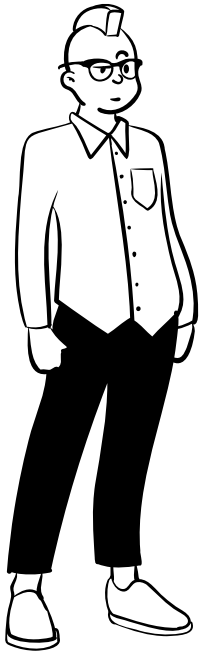
Personas

Medical specialist
Do give the patient the best possible care to their knowledge and experience
Motivated by being meaningful for the patient

Literature specialist
Do contribute the most relevant literature at the right moment
Motivated by contributing to the best stream of information

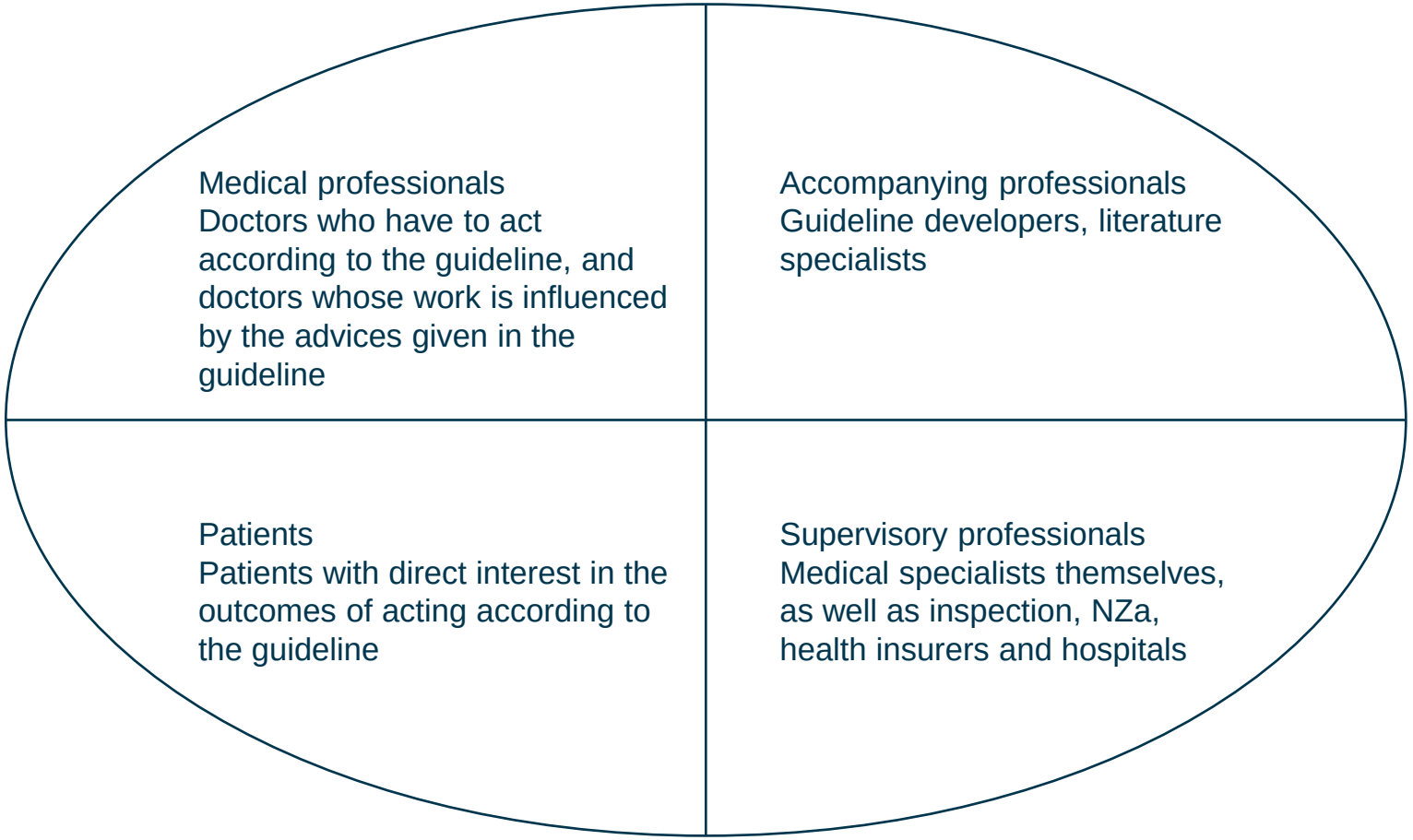
Working group member medical specialist
Do give their colleagues the best advice possible
Motivated by combining evidence from literature with experience from medical practice

Patient
Do receive care for their personal situation
Motivated by their personal beneficial outcomse regarding their condition while taking into account their circumstances and values



Guideline consultant
Aim to guide medical specialists towards best clinical advice possible
Motivated by the best care for individual patients

Stakeholder groups



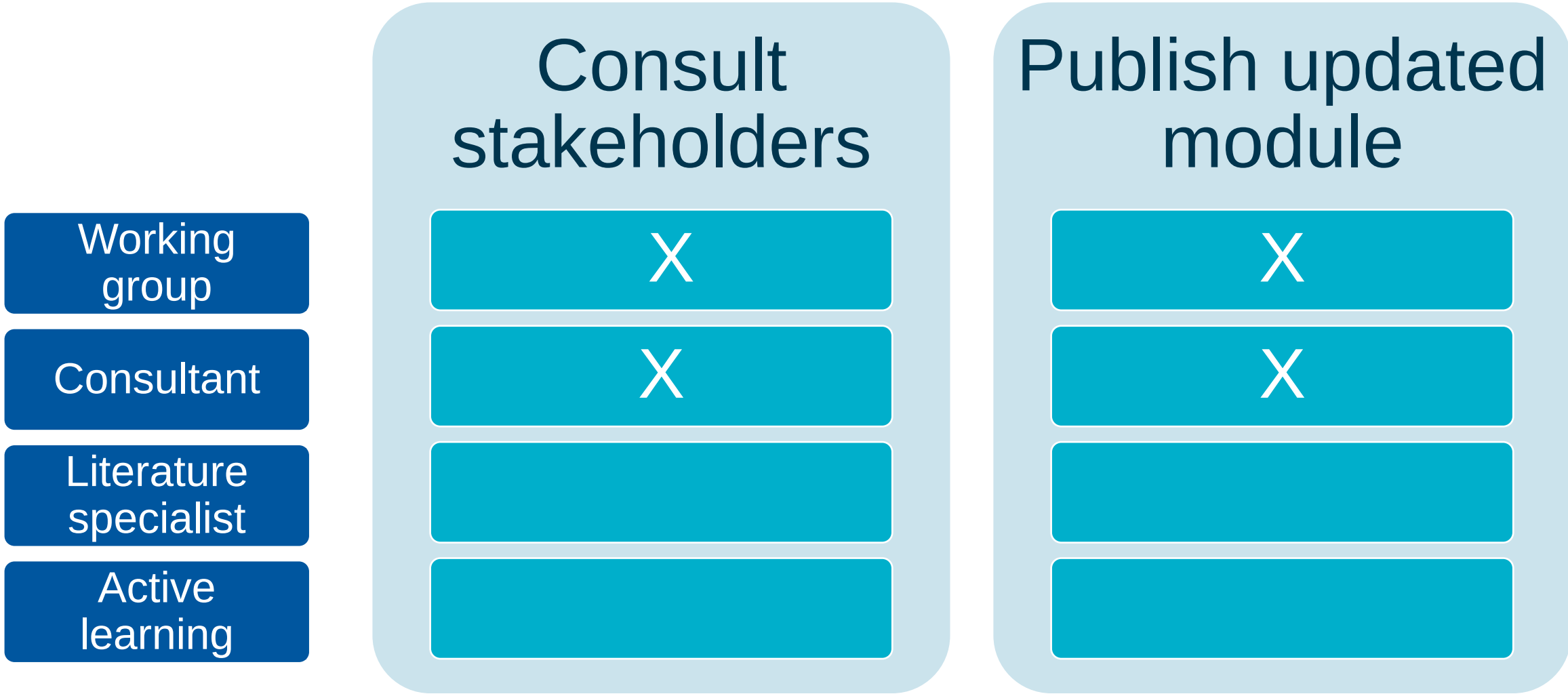
Workflow - Preparation

	List modules in cluster of guidelines	Determine the need for update	Prioritize the need for update
Working group		X	X
Consultant	X	X	X
Literature specialist			
Active learning			

Workflow – Updating modules

	Update literature search	Select literature	Write module
Working group	X	X	X
Consultant	X	X	X
Literature specialist	X	X	
Active learning			

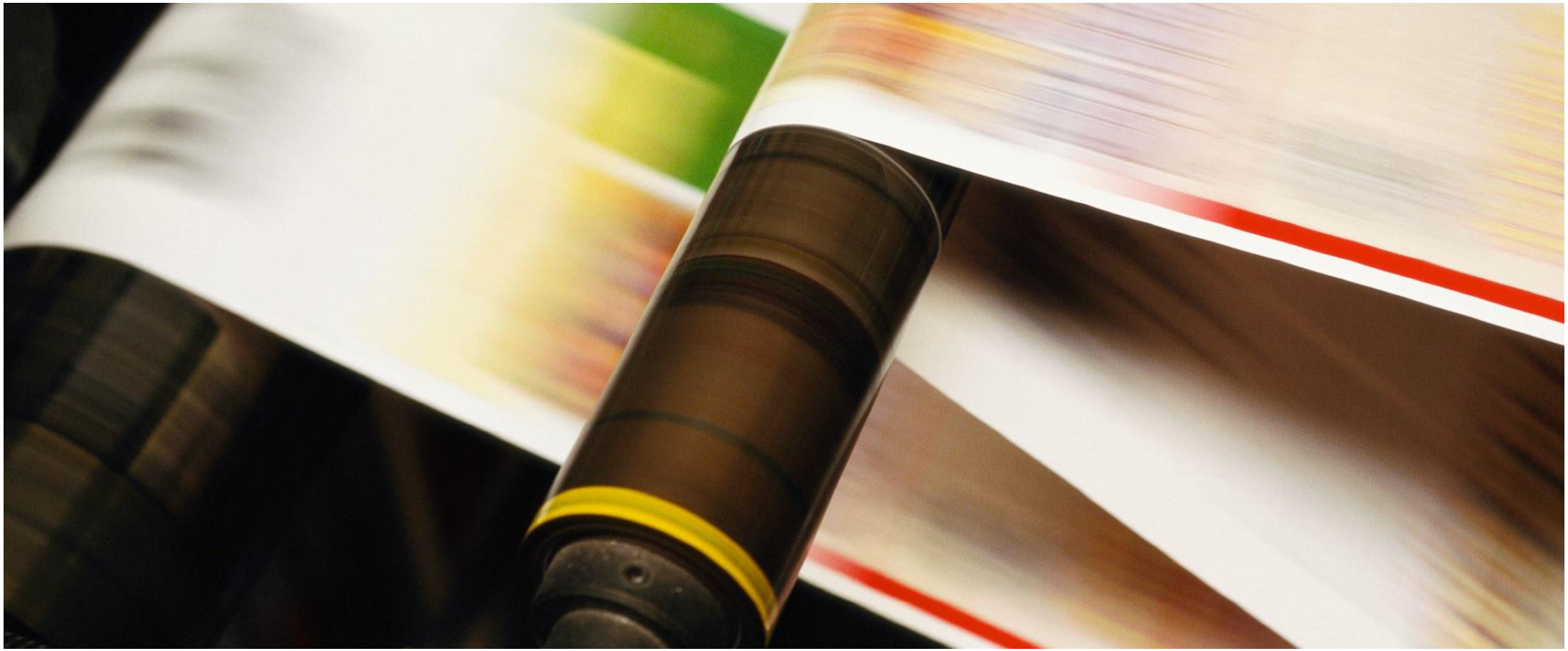
Workflow – Concluding phase



Workflow – Updating modules

	Update literature search	Select literature	Write module
Working group	X	X	X
Consultant	X	X	X
Literature specialist	X	X	
Active learning			

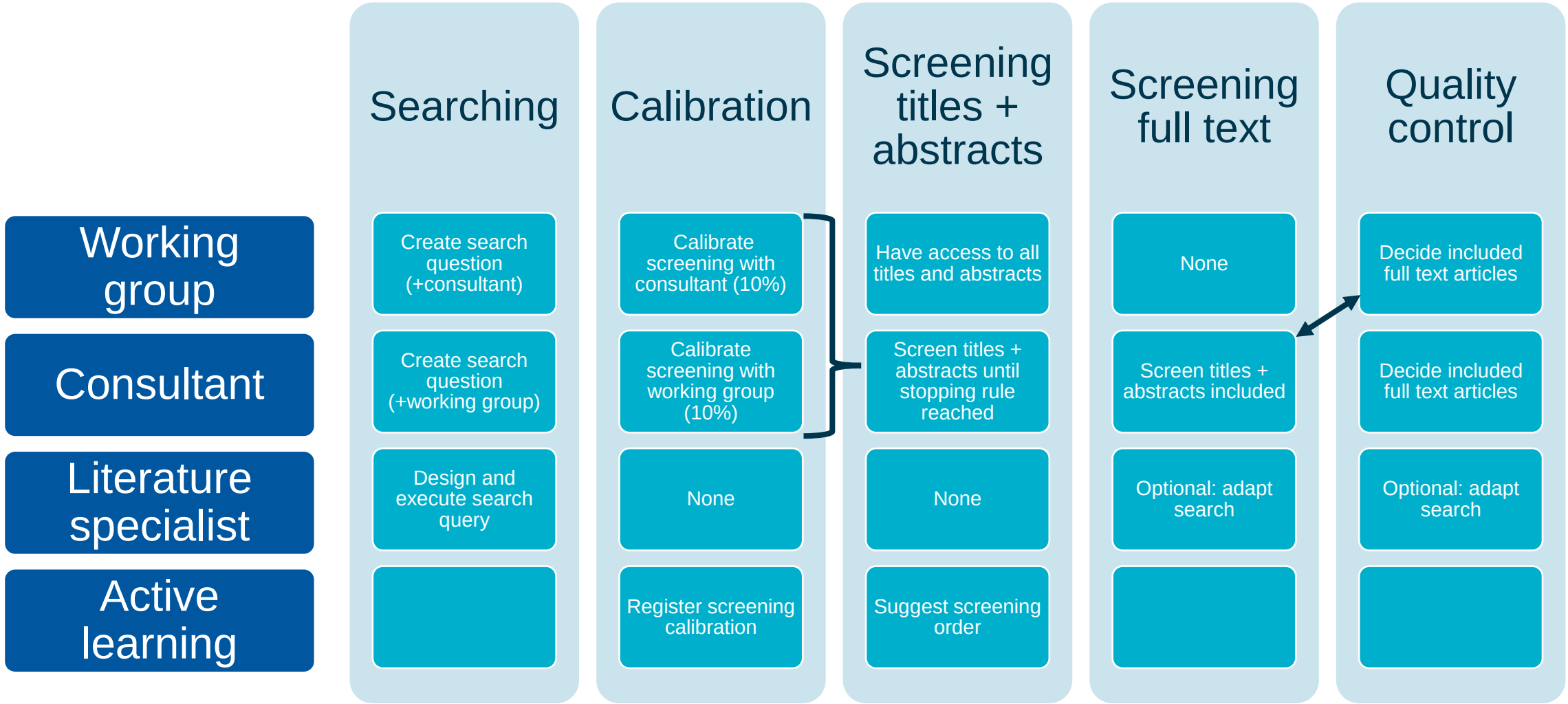
Implementation literature screening scenario



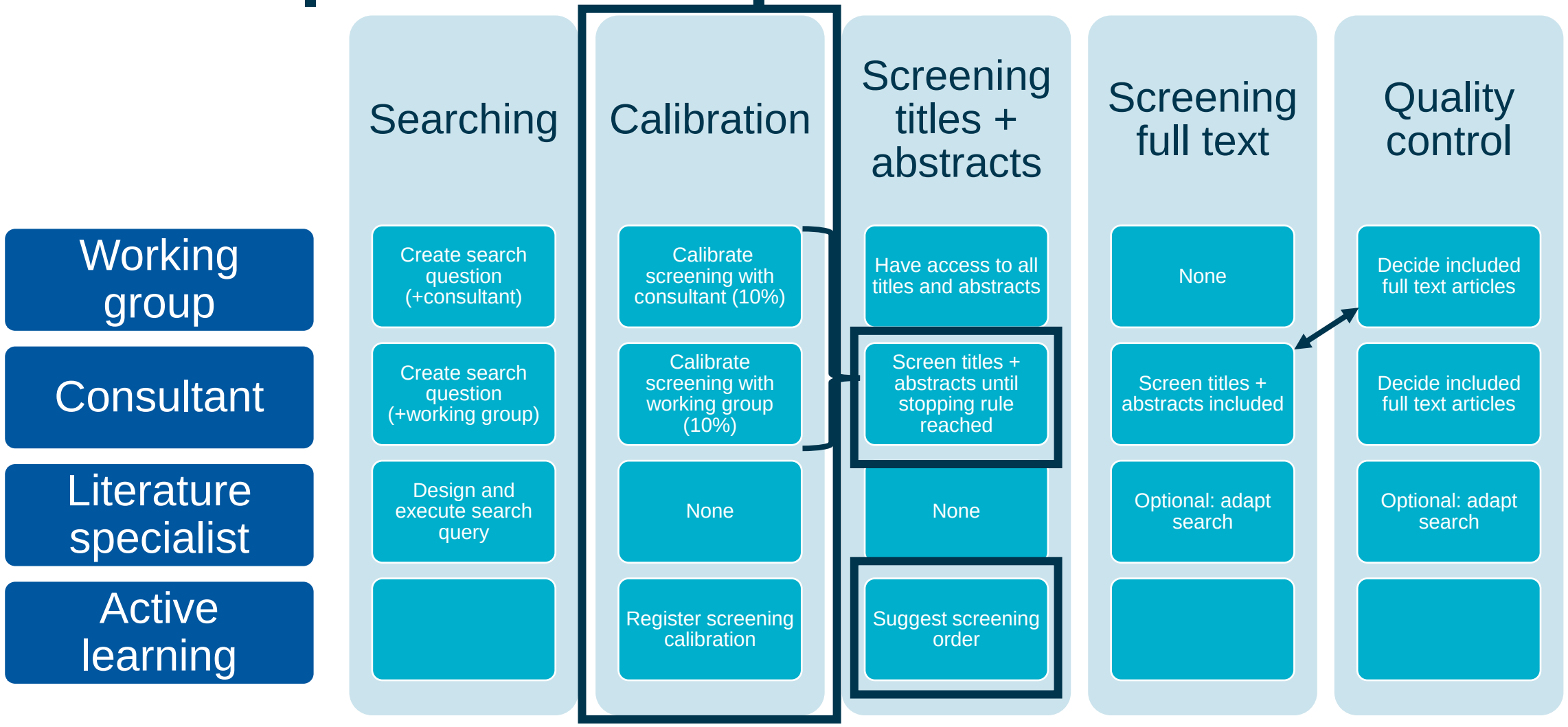
Current workflow

	Searching	Calibration	Screening titles + abstracts	Screening full text	Quality control
Working group	Create search question (+consultant)	None	Screen all titles + abstracts	None	Decide included full text articles
Consultant	Create search question (+working group)	None	Optional: screen all titles + abstracts	Screen titles + abstracts included by working group	Decide included full text articles
Literature specialist	Design and execute search query	None	None	Optional: adapt search	Optional: adapt search

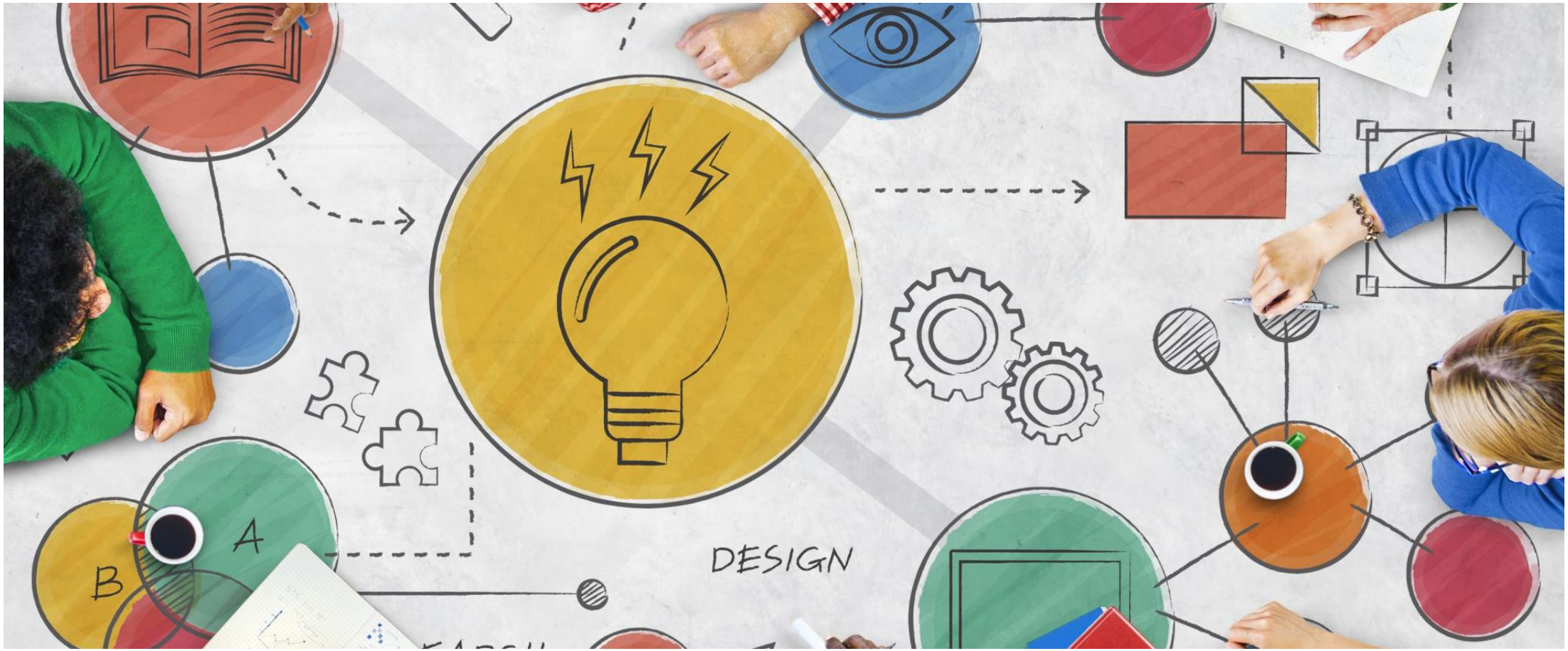
Optimized process using active learning



Novel process steps



Implementation need for update scenario

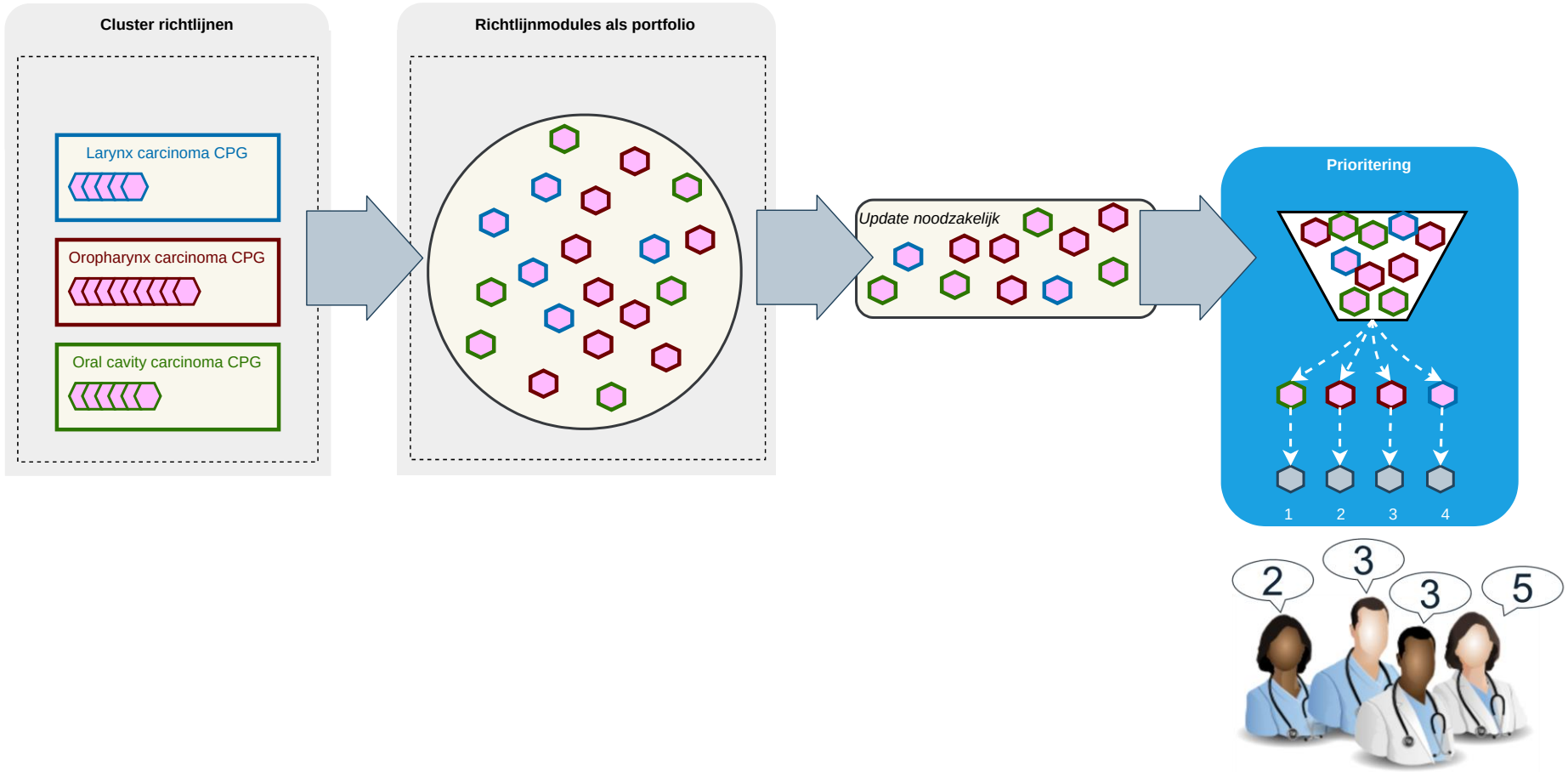


Preparation phase workflow suggestion

	List modules in cluster of guidelines	Determine the need for update	Prioritize the need for update
Working group		X	X
Consultant	X	X	X
Literature specialist			
Active learning			

Need for update – current process

Cluster of 10-50 subject-related guideline modules A, B, C, *n*…



	A	B	C
	5	0	2
	0	3	3
	0	1	3
	2	3	5

Why is this a key stage?

- Guideline modules are based on systematic reviews
- The current prioritization process is based on expert opinion
- Prioritizing persons are not always aware of all new literature
- Often, modules are updated without finding relevant new literature
- This leads to waste of resources downstream in the process
- Aid by AL may improve prioritization

Need for update – ASReview collaboration

Phases Description	Redo search	Import and setup	Literature selection	Export	Prioritize
Activities	• Collect search history • Redo search • Label records by module • Combine datasets	• Label previously included records as prior knowledge • Import records in ASReview • Setup and train models	• Mark records as (ir)relevant • Stop when planned • Switch models • Repeat 1-2	• Choose file type • Choose to export only included • Export dataset	• Sort dataset by included per cluster and publication year • Select the modules with the most relevant recent literature
Opportunities		• Model/cluster switch in setup • Template for bulk import and labels • Clustering aid • Generation of ‘perfect’ abstract	• Cluster information view • LLM-aided preselection • Switch cluster when needed	• Export per cluster • Combine LLM advice and screener’s	
Who?	Literature specialist	Consultant	Consultant/working group	Consultant	Working group
Time	8 hours	30 minutes	4 hours?	10 minutes	4 hours?
ELAS	-	Easy import of large dataset	Aid selection by assessing relevance	Easy exporting and analysis	-

Highlights

- ASReview may aid in scaling up of screening tasks
- Prioritizing can be performed based on relevant criteria
- The strategy of including multiple modules in the same task
- Re-use of previously selected literature

Key takeaways

- For guideline developers:
  - To be able to view the guideline development process as a production process with information
  - To connect with medical specialists about their underlying needs and the way to contribute their expertise

- For ASReview developers:
  - Explore clustering and LLM options for scaling together with users
  - Explore adding unlabeled literature to existing dataset which already has a trained model and rerun model