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Theoretical Article

Promotion of Medicines at Different Stages of the Drug Life Cycle

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Abstract

The article examines the promotion of medicines at different stages of the drug life cycle. The relevance of the topic is determined by the fact that pharmaceutical promotion affects physician awareness, prescribing decisions, therapy accessibility and the efficiency of marketing budget allocation. The purpose of the article is to develop an applied model for allocating promotion channels according to the stage of the drug life cycle. The methodological basis of the study includes the analysis of scientific publications from 2000 to 2026, thematic systematization, classification of promotion channels and the development of the author's PLC-PromoRx model. The article identifies five stages: pre-launch, launch, growth, maturity and decline / loss of exclusivity (LOE). For each stage, the target audience, promotion objectives, communication channels, key performance indicators and main compliance risks are defined. A channel allocation matrix and a KPI system for evaluating promotion performance are proposed. The article concludes that the promotion of medicines should be linked to the stage of the drug life cycle, the level of evidence, access to physicians, the capabilities of digital channels and regulatory restrictions.

Keywords: pharmaceutical promotion, drug life cycle, pharmaceutical marketing, omnichannel engagement, e-detailing, lifecycle management, patient support programs, compliance

1. Introduction

The promotion of medicines is one of the most sensitive areas of pharmaceutical marketing, since its results are reflected both in the commercial performance of a drug and in the quality of information provided to healthcare professionals, the appropriateness of therapy prescribing, patient adherence and the rationality of healthcare system expenditures. For this reason, pharmaceutical promotion should be considered as a regulated management process related to medical data, evidence, ethical requirements and the drug life cycle.

The interaction between physicians and the pharmaceutical industry has long been the subject of scientific discussion. For example, A. Wazana shows that gifts, visits by representatives and other forms of interaction may influence physicians' professional attitudes (Wazana, 2000). A systematic review by G. K. Spurling et al. links information from pharmaceutical companies to the quality, quantity and cost of physicians' prescribing (Spurling et al., 2010). F. Fickweiler et al. also emphasize the relationship between physicians' contacts with pharmaceutical sales representatives and changes in prescribing habits (Fickweiler et al., 2017). A meta-analysis by H. Brax et al. confirms that physicians' interaction with pharmaceutical companies may be associated with clinical practice and therapy-related decisions (Brax et al., 2017).

At the same time, pharmaceutical promotion cannot be reduced to a single contact with a physician. In

practice, it includes personal detailing, e-detailing, remote detailing, medical education, congress activities, work with key opinion leaders (KOLs), direct-to-consumer communication (DTC), patient support programs, real-world evidence (RWE) communication and market access communication. The role of each channel changes depending on the stage of the drug life cycle.

At the pre-launch stage, the drug is not yet commercially available; therefore, the main focus shifts to scientific communication, market preparation and disease awareness. At the launch stage, it is important to explain clinical value, inform healthcare professionals (HCPs) and support access. At the growth stage, promotion is associated with audience expansion, omnichannel coordination and the improvement of appropriate use. At the maturity stage, the importance of maintaining the drug's position, patient programs and RWE communication increases. At the decline or loss of exclusivity (LOE) stage, promotion should take into account generic competition, the reduction of exclusivity and the need to manage the residual value of the brand. These considerations define the purpose and subject of the present study.

The purpose of this article is to develop a model for promoting medicines at different stages of the drug life cycle.

To achieve this purpose, the following tasks were set:

1. to identify the main stages of the drug life cycle;
2. to define promotion objectives for each stage;
3. to classify pharmaceutical promotion channels;
4. to propose the PLC-PromoRx model for allocating channels across drug life cycle stages;
5. to develop a system of indicators for evaluating pharmaceutical promotion performance.

2. Materials and Methods

The materials of the study include scientific publications on pharmaceutical promotion, pharmaceutical marketing, the drug life cycle, remote detailing, e-detailing, omnichannel promotion, DTC communication, patient support programs, market access and lifecycle management. The selection of sources covered publications from 2000 to 2026. This time frame was chosen for two reasons. First, important studies on the influence of pharmaceutical promotion on physicians' prescribing decisions were published in the early 2000s. Second, after 2020, the role of remote and digital channels for interacting with physicians and patients increased significantly.

The search was conducted in PubMed, Google Scholar, ScienceDirect, SpringerLink, MDPI, JMIR, PLOS, Taylor & Francis, SAGE Journals and on the websites of scientific journals. The following search combinations were used: pharmaceutical promotion, drug promotion, pharmaceutical marketing, physician prescribing behavior, drug life cycle, product life cycle management in pharmaceuticals, pharmaceutical launch, e-detailing, remote detailing, omnichannel healthcare, direct-to-consumer advertising, patient support programs, lifecycle management, patent cliff and real-world evidence.

The inclusion criteria were as follows: the scientific nature of the publication, relevance to the promotion of medicines or the drug life cycle, and applicability of the findings to the development of a stage-based promotion model. The exclusion criteria were promotional materials from pharmaceutical companies, publications without authorship, industry notes without methodology, materials unrelated to the topic of the article, duplicate sources and texts in which the origin of data could not be established.

The methodological basis of the article includes a narrative review, thematic analysis, classification of promotion channels, comparison of drug life cycle stages and the development of the author's PLC-PromoRx model. No statistical analysis of primary data is conducted in the article. Quantitative values have an illustrative and anonymized character and are used to demonstrate the main principle of channel allocation.

As a basis for evaluating promotion, the calculated Pharmaceutical Promotion Index (PPI) is proposed:

$$PPI_t = 100 \times (0.25R_t + 0.20E_t + 0.20A_t + 0.15C_t + 0.10P_t + 0.10S_t) \times (1 - CR_t)$$

where:

PPIt is the pharmaceutical promotion performance index at stage t; Rt is the quality of target audience reach; Et is the quality of audience engagement; At is the response in prescribing or therapy adoption; Ct is the coordination of channels; Pt is the contribution of patient support and adherence tools; St is the strength of scientific and clinical evidence; CRt is the compliance risk coefficient.

The PPI indicator is used to compare drug life cycle stages. It is assumed that it should be applied together with data on prescribing, access, patient profiles, competitor activity and regulatory restrictions.

3. Results and Discussion

Pharmaceutical promotion has different intensity and structure depending on the drug life cycle. The scientific literature clearly reflects the view that promotional expenditures may influence physicians' choice and prescribing dynamics. F. F. Gönül et al. analyze the impact of prescription drug promotion on physicians' choice behavior (Gönül et al., 2001). S. Narayanan et al. examine return on investment implications for pharmaceutical promotional expenditures and the role of marketing-mix interactions (Narayanan et al., 2004). S. T. M. Kremer et al. systematize evidence on the effectiveness of pharmaceutical promotional expenditures (Kremer et al., 2008). Similarly, M. Fischer and S. Albers show the difference between patient-oriented and physician-oriented marketing in generating primary demand (Fischer & Albers, 2010). H. S. Nair et al. provide a detailed analysis of the role of opinion leaders in physicians' prescribing behavior (Nair et al., 2010).

Based on these theoretical sources and the findings presented in them, the main emphases were identified for developing an approach based on the drug life cycle. Although these emphases were outlined in the introduction, their content can be specified as follows:

- at the early stages of the drug life cycle, promotion should form medical understanding and trust in the evidence base;
- at later stages, retention of prescribing, work with adherence, competition management and reduction of cost per effective contact become especially important.

3.1 Drug life cycle stages and promotion logic

Within the framework of this article, five stages of the drug life cycle are identified. They are most applicable to the general logic of pharmaceutical promotion and may be adapted depending on the regulatory status of a specific product.

1. Pre-launch. At this stage, the drug has not yet entered the market; therefore, commercial communication is limited. The main tasks are disease awareness, scientific market preparation, work with KOLs,

discussion of unmet medical need, preparation of medical education materials and market access planning. At this stage, it is especially important to separate medical and commercial communication.

2. Launch. At this stage, the drug obtains market access, and the main task is to explain its clinical value. Promotion is directed at HCPs, pharmaceutical market specialists, medical advisors, pharmacists and other professional groups. The main channels include personal promotion channels, including e-detailing and remote detailing, continuing medical education (CME) and peer education.

3. Growth. At this stage, the total number of prescriptions increases, the target audience expands and competition for physicians' attention intensifies. Promotion is built around omnichannel coordination. Digital channels, remote interaction and platform-based communication become important. Patient support programs are used, and interaction data are analyzed.

4. Maturity. At this stage, sales stabilize, the drug occupies a defined position in therapy and competition increases. Priorities include maintaining loyalty among physicians and consumers, RWE communication, patient support programs, work with adherence and demonstrating value to the target audience.

5. Decline / LOE. At this stage, after the loss of exclusivity, the drug faces competition from generics and a decrease in market share. Lifecycle management becomes relevant, with an emphasis on defining further priorities, such as returning to the growth stage through new competitive advantages, new indications, reformulations, maintaining continuity of therapy and rationally reducing promotional costs.

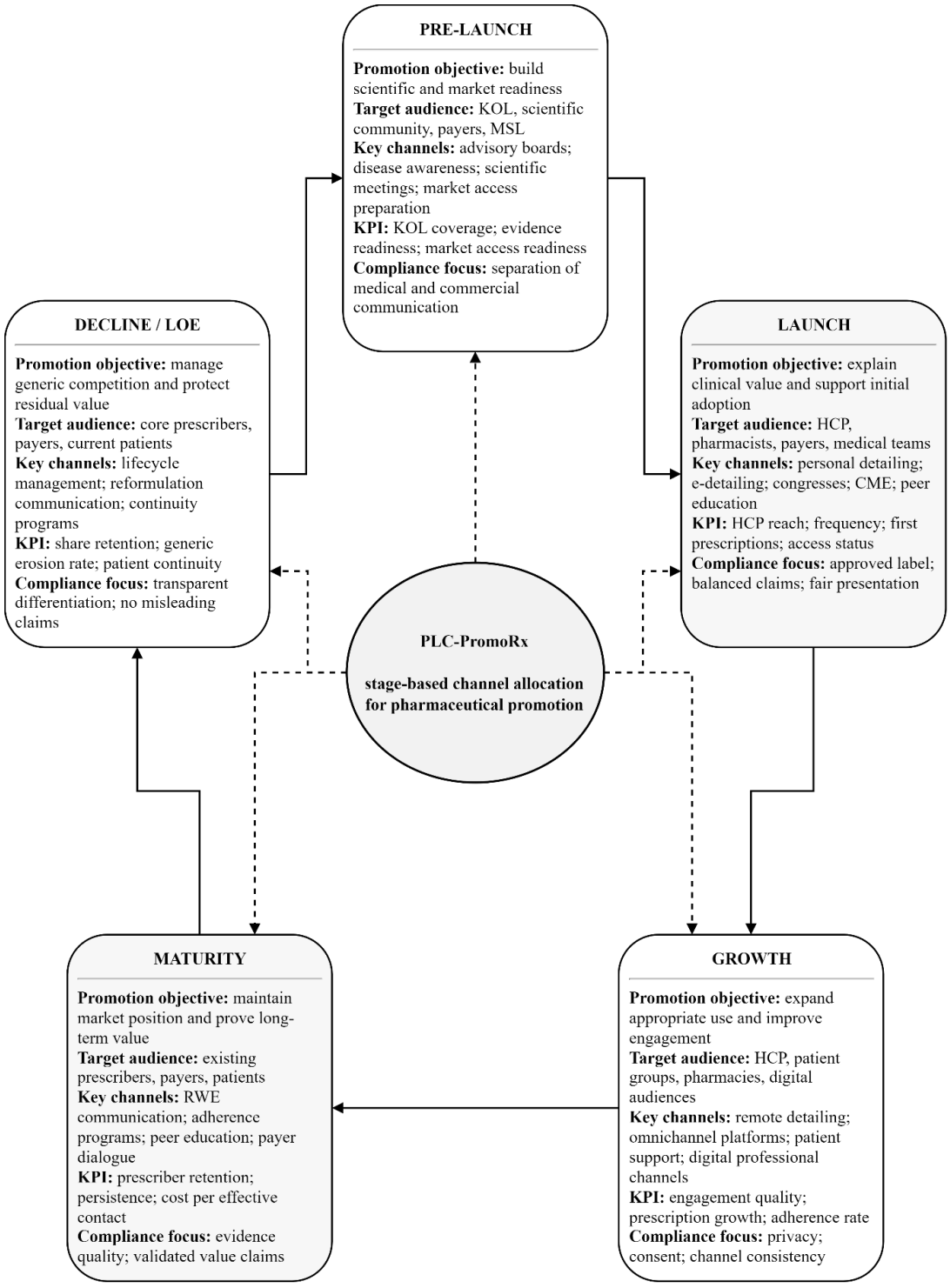

Figure 1. Life Cycle-Based Model of Pharmaceutical Promotion

3.2 Promotion channels across the drug life cycle

The promotion of medicines develops through the joint use of personal, digital, scientific and patient-oriented channels. Direct-to-consumer communication (DTC) and direct-to-consumer advertising (DTCA) are per-

missible only in countries where they are legally allowed. For example, J. M. Donohue et al. illustrate the dynamics of DTC advertising of prescription drugs over a ten-year period in the United States (Donohue et al., 2007). Similarly, T. K. Mackey et al. examine the growth of digital DTC and its global policy implications (Mackey et al., 2015). K. J. Aikin et al. analyze DTC promotion on mobile devices and emphasize the important role of controlling the content of digital communication (Aikin et al., 2017). Given this limitation, the article focuses on the general logic of drug promotion, while recognizing that the permissibility and format of DTC / DTCA depend on national regulation.

Digital channels play a special role after launch and at the growth stage. F. M. Alkhateeb et al. apply a diffusion model to physicians' adoption of pharmaceutical e-detailing (Alkhateeb et al., 2010). H. W. Kim and H. Chang analyze the acceptance of remote e-detailing by medical representatives through the Technology Acceptance Model (Kim & Chang, 2022). E. Yılmaz Altuntaş and E. C. Yalçın note the increased role of remote promotion in the pharmaceutical sector, especially after the COVID-19 pandemic, and its relationship with sales force automation (Yılmaz Altuntaş & Yalçın, 2023). These studies provide similar arguments that physicians can accept and use digital channels to maintain communication with medical representatives, which makes digital channels important in managing the drug life cycle and its promotion.

In this regard, the omnichannel approach is developing widely. It is important for working with physicians and patients because audiences receive information from different sources. A. Moreira et al., in their review of omnichannel interaction in healthcare services, describe the seamless integration of communication channels into a single service environment and show its positive effect on healthcare communication (Moreira et al., 2023). A. Blasiak et al. associate these effects with the functional capabilities of omnichannel communication for patient engagement and behavior change in digital health interventions (Blasiak et al., 2022).

Based on this, the main objectives and promotion channels corresponding to the stages of the drug life cycle are presented in Table 1.

Table 1. Promotion objectives and channels by drug life cycle stage

Life cycle stage	Main audience	Promotion objective	Key channels	Compliance focus
Pre-launch	KOL, scientific community, payers	Build scientific and market readiness	Advisory boards, disease awareness, scientific meetings, market access preparation	Separation of medical and commercial communication
Launch	HCP, pharmacists, payers, MSL	Explain clinical value and support adoption	Personal detailing, e-detailing, congresses, CME, peer education	Approved label, balanced claims, fair presentation
Growth	HCP, patient groups, pharmacies	Expand appropriate use and improve engagement	Remote detailing, omnichannel platforms, patient support, digital professional channels	Consent, privacy, channel consistency
Maturity	Existing prescribers, payers, patients	Maintain position and prove long-term value	RWE communication, adherence programs, peer education, payer dialogue	Evidence quality, validated claims
Decline / LOE	Core prescribers, payers, current patients	Manage competition and protect residual value	Lifecycle management, reformulation communication, continuity programs	No misleading differentiation, transparent value claims

Source: prepared by the author

3.3 PLC-PromoRx model

To formalize and systematize the promotion of medicines, the PLC-PromoRx model is proposed. Its name and content reflect the connection between the product life cycle (PLC) and pharmaceutical promotion. The model is based on the following principle: life cycle stage → audience → objective → channel mix → KPI → compliance risk.

The model assumes that the choice of channel should be determined by the objective of a specific stage:

- at the pre-launch stage, the same tools as at the maturity stage cannot be used;
- at the launch stage, it is inefficient to immediately shift the main focus to patient support if physicians have not yet received sufficient clinical explanation;
- at the decline / LOE stage, it is not reasonable to maintain the previous intensity of expensive personal promotion if the market is already shifting toward generics.

Studies of the life cycle of pharmaceutical products show that the main patterns of growth and decline differ by therapeutic area and type of drug. For example, F. Teramae et al. demonstrate that pharmaceutical product life cycle patterns depend on the therapeutic area and modality of the drug (Teramae et al., 2020). A. Mousavi et al. examine lifecycle management of generic medicines through system dynamics and link the life cycle with demand forecasting, marketing activities and research and development activities (Mousavi et al., 2022). V. Prajapati and H. Dureja describe product lifecycle management in the pharmaceutical industry as a system of managerial actions aimed at extending the value of a drug (Prajapati & Dureja, 2012). D. Z. Kvesic proposes marketing strategies for pharmaceutical product lifecycle management (Kvesic, 2008). Based on these findings, the PLC-PromoRx model was specified in the form of an algorithm.

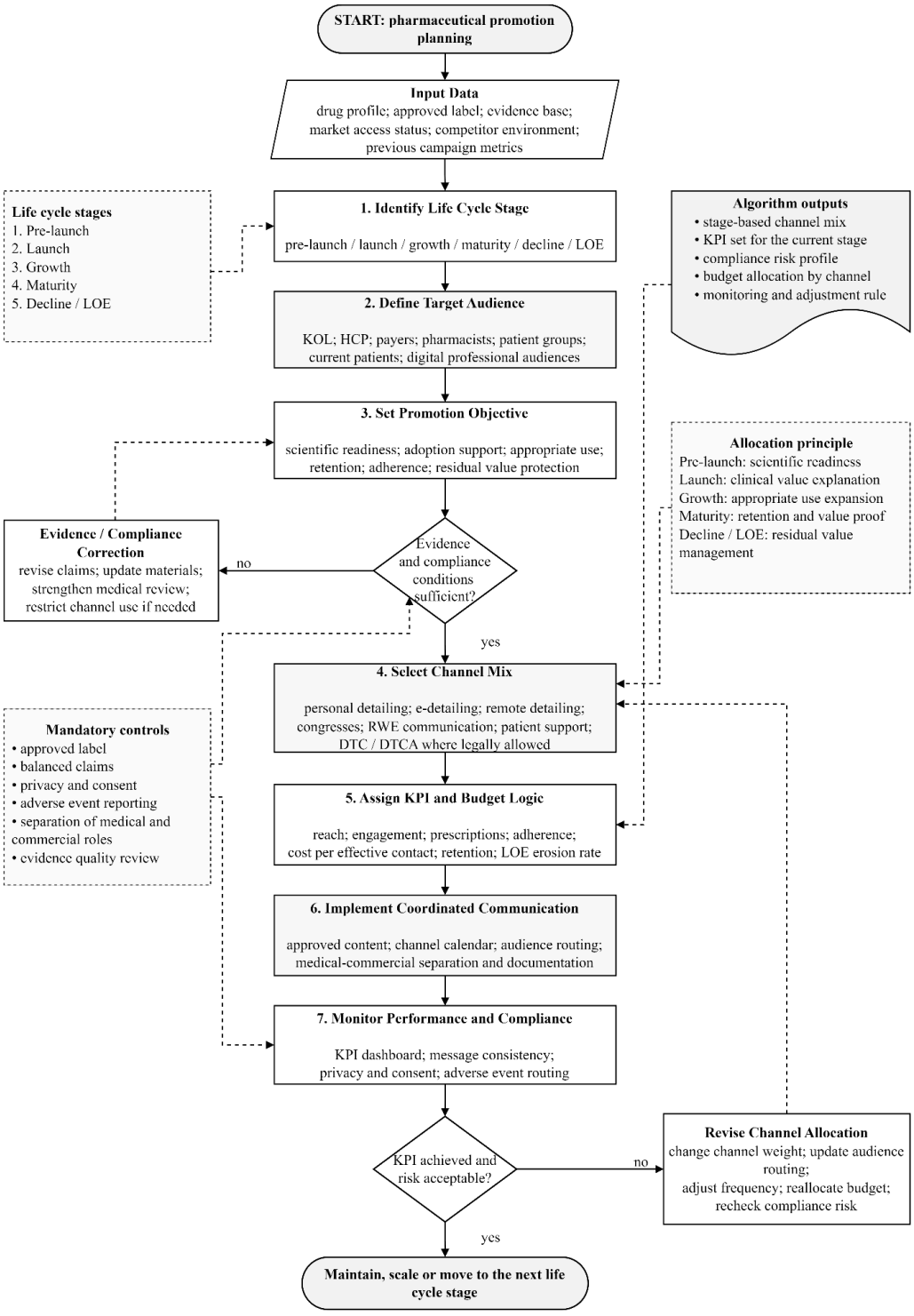

Figure 2. PLC-PromoRx Channel Allocation Algorithm

This structure makes it possible to connect marketing activity, medical communication and risk control into a single system. At the same time, the model does not impose one universal scheme for all medicines. The therapeutic area, regulatory status, availability of alternatives, price segment, presence of generics and requirements of the target audience should be taken into account when configuring communication channels and their combinations.

To control the implementation of the PLC-PromoRx Channel Allocation Algorithm, the KPI system presented in Table 2 is used.

Table 2. KPI system for pharmaceutical promotion across life cycle stages

Stage	Primary KPI	Secondary KPI	Risk indicator
Pre-launch	KOL coverage	Disease awareness reach, evidence readiness	Off-label communication risk
Launch	HCP reach and frequency	First prescriptions, access status, training completion	Unbalanced claim risk
Growth	Engagement quality	Prescription growth, remote detailing response, adherence rate	Privacy and consent risk
Maturity	Prescriber retention	Persistence, RWE engagement, cost per effective contact	Unsupported value claim risk
Decline / LOE	Share retention	Generic erosion rate, patient continuity, budget efficiency	Misleading differentiation risk

Source: prepared by the author.

3.4 Lifecycle management, market access and patient support

At later stages of the drug life cycle, the importance of lifecycle management increases. For example, A. S. Kesselheim links the growth of healthcare system costs to lifecycle management strategies in the pharmaceutical market (Kesselheim, 2013). S. Murteira et al. consider drug reformulations and repositioning as tools of the pharmaceutical industry that affect drug access to the market (Murteira et al., 2013). M. A. Koch et al. describe pharmaceutical market access, its current state and key challenges, which is especially important for the launch stage and the subsequent retention of the drug in reimbursement systems (Koch et al., 2015).

Patient support programs become especially significant at the growth and maturity stages because they help support adherence, reduce patient attrition and strengthen the practical value of therapy. A. Ganguli et al., in a targeted systematic review, examine in detail the impact of patient support programs on adherence, as well as on clinical, humanistic and economic outcomes (Ganguli et al., 2016). In the PLC-PromoRx model, patient support is included in the PPI calculation through the P_t indicator, since the contribution of such programs depends on the stage of the drug life cycle and the characteristics of therapy. Taking this into account, the allocation of channels according to the PLC-PromoRx matrix was calculated.

Promotion channel	Pre-launch	Launch	Growth	Maturity	Decline / LOE
KOL engagement	0,90	0,85	0,65	0,55	0,40
Personal detailing	0,20	0,95	0,80	0,55	0,30
E-detailing	0,30	0,80	0,90	0,70	0,45
Remote detailing	0,20	0,70	0,85	0,75	0,50
Congress activities	0,80	0,85	0,70	0,55	0,30
Patient support programs	0,10	0,45	0,80	0,90	0,65
RWE communication	0,20	0,45	0,65	0,90	0,70
Market access communication	0,75	0,85	0,70	0,65	0,55
DTC / DTCA where allowed	0,10	0,45	0,75	0,65	0,35

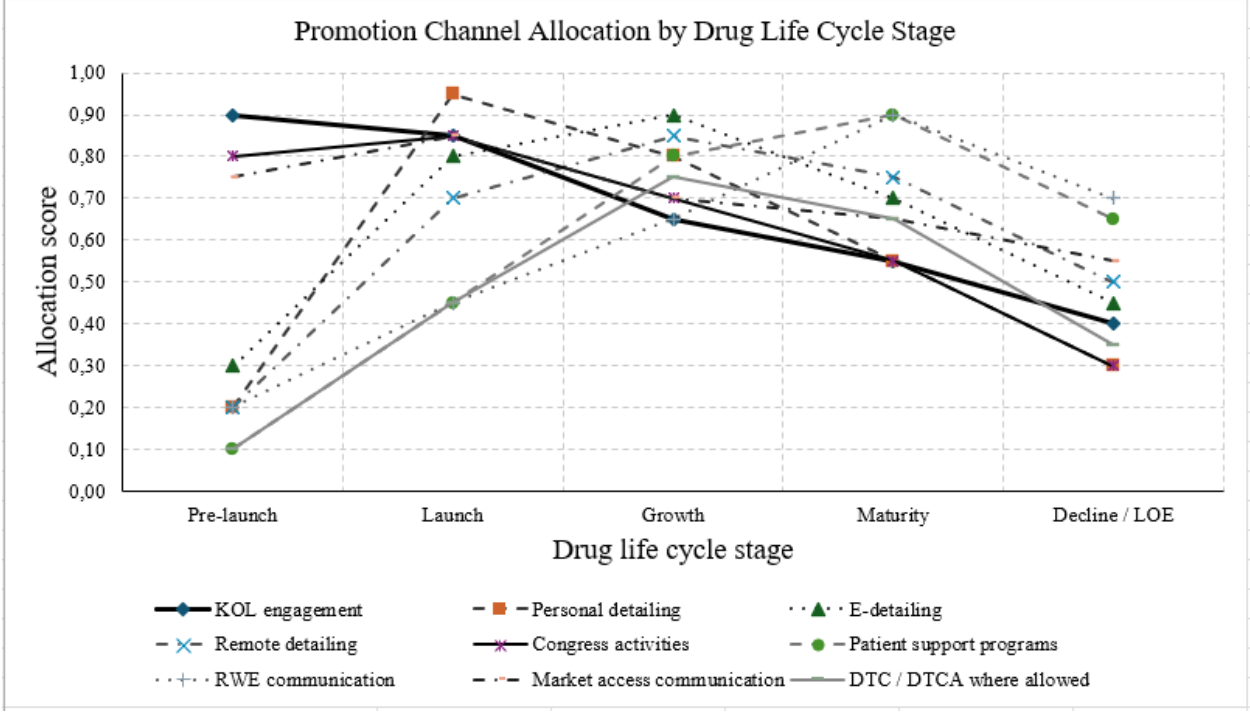

Figure 3. Channel allocation matrix for PLC-PromoRx

The data show that the structure of promotion should change as the drug moves through its life cycle. At each stage, as noted earlier, certain promotion channels and techniques receive higher values, which serves as a basis for optimizing the selected promotion strategies.

4. Conclusions

The article proposes a model for promoting medicines at different stages of the drug life cycle. The PLC-PromoRx model makes it possible to connect the life cycle stage, target audience, promotion objective, channel mix, KPI and compliance risks.

The analysis showed that at each stage of the drug life cycle in the pharmaceutical market, specific channels and methods of promotion are justified. Accordingly, a life cycle-based model, an author's index and an algorithm were developed to support the work of pharmaceutical marketing specialists.

The practical significance of the article lies in the possibility of using PLC-PromoRx as a basis for planning pharmaceutical promotion. The model can be applied when preparing a launch plan, revising the selected channel mix, evaluating the effectiveness of marketing expenditures and setting KPIs for different stages of

the drug life cycle.

The limitations of the study are related to its theoretical, analytical and review-based character. Further research may focus on empirical validation of PLC-PromoRx, comparison of therapeutic areas and assessment of the relationship between stage-based promotion, cost per effective contact and final prescribing outcomes.

References

1. Wazana, A. (2000). Physicians and the pharmaceutical industry: Is a gift ever just a gift? *JAMA, 283*(3), 373 - 380. https://doi.org/10.1001/jama.283.3.373

2. Spurling, G. K., Mansfield, P. R., Montgomery, B. D., Lexchin, J., Doust, J., Othman, N., & Vitry, A. I. (2010). Information from pharmaceutical companies and the quality, quantity, and cost of physicians' prescribing: A systematic review. *PLOS Medicine, 7*(10), e1000352. https://doi.org/10.1371/journal.pmed.1000352

3. Fickweiler, F., Fickweiler, W., & Urbach, E. (2017). Interactions between physicians and the pharmaceutical industry generally and sales representatives specifically and their association with physicians' attitudes and prescribing habits: A systematic review. *BMJ Open, 7*(9), e016408. https://doi.org/10.1136/bmjopen-2017-016408

4. Brax, H., Fadlallah, R., Al-Khaled, L., Kahale, L. A., Nas, H., El-Jardali, F., & Akl, E. A. (2017). Association between physicians' interaction with pharmaceutical companies and their clinical practices: A systematic review and meta-analysis. *PLOS ONE, 12*(4), e0175493. https://doi.org/10.1371/journal.pone.0175493

5. Gönül, F. F., Carter, F., Petrova, E., & Srinivasan, K. (2001). Promotion of prescription drugs and its impact on physicians' choice behavior. *Journal of Marketing, 65*(3), 79 - 90. https://doi.org/10.1509/jmkg.65.3.79.18329

6. Narayanan, S., Desiraju, R., & Chintagunta, P. K. (2004). Return on investment implications for pharmaceutical promotional expenditures: The role of marketing-mix interactions. *Journal of Marketing, 68*(4), 90 - 105. https://doi.org/10.1509/jmkg.68.4.90.42734

7. Kremer, S. T. M., Bijmolt, T. H. A., Leeflang, P. S. H., & Wieringa, J. E. (2008). Generalizations on the effectiveness of pharmaceutical promotional expenditures. *International Journal of Research in Marketing, 25*(4), 234 - 246. https://doi.org/10.1016/j.ijresmar.2008.08.001

8. Fischer, M., & Albers, S. (2010). Patient- or physician-oriented marketing: What drives primary demand for prescription drugs? *Journal of Marketing Research, 47*(1), 103 - 121. https://doi.org/10.1509/jmkr.47.1.103

9. Nair, H. S., Manchanda, P., & Bhatia, T. (2010). Asymmetric social interactions in physician prescription behavior: The role of opinion leaders. *Journal of Marketing Research, 47*(5), 883 - 895. https://doi.org/10.1509/jmkr.47.5.883

10. Donohue, J. M., Cevasco, M., & Rosenthal, M. B. (2007). A decade of direct-to-consumer advertising of prescription drugs. *The New England Journal of Medicine, 357*(7), 673 - 681. https://doi.org/10.1056/NEJMsa070502

11. Mackey, T. K., Cuomo, R. E., & Liang, B. A. (2015). The rise of digital direct-to-consumer advertising? Comparison of direct-to-consumer advertising expenditure trends from publicly available data sources

and global policy implications. *BMC Health Services Research, 15*, 236. https://doi.org/10.1186/s12913-015-0885-1

12. Aikin, K. J., Sullivan, H. W., Dolina, S., Lynch, M., & Squiers, L. B. (2017). Direct-to-consumer promotion of prescription drugs on mobile devices: Content analysis. *Journal of Medical Internet Research, 19*(7), e225. https://doi.org/10.2196/jmir.7306

13. Alkhateeb, F. M., Khanfar, N. M., & Loudon, D. (2010). Physicians' adoption of pharmaceutical e-detailing: Application of Rogers' innovation-diffusion model. *Services Marketing Quarterly, 31*(1), 116 - 132. https://doi.org/10.1080/15332960903408575

14. Kim, H. W., & Chang, H. (2022). Medical representatives' user acceptance of remote e-detailing technology: A moderated mediation analysis of technology acceptance model. *Healthcare Informatics Research, 28*(1), 68 - 76. https://doi.org/10.4258/hir.2022.28.1.68

15. Yılmaz Altuntaş, E., & Yalçın, E. C. (2023). COVID-19 pandemic learning: The uprising of remote detailing in pharmaceutical sector using sales force automation and its sustainable impact on continuing medical education. *Sustainability, 15*(11), 8955. https://doi.org/10.3390/su15118955

16. Moreira, A., Alves, C., Machado, J., & Santos, M. F. (2023). An overview of omnichannel interaction in health care services. *Mayo Clinic Proceedings: Digital Health, 1*(2), 77 - 93. https://doi.org/10.1016/j.mcpdig.2023.03.002

17. Blasiak, A., Khong, J., Kee, T., & Ho, D. (2022). Omnichannel communication to boost patient engagement and behavioral change with digital health interventions. *Journal of Medical Internet Research, 24*(11), e41463. https://doi.org/10.2196/41463

18. Teramae, F., Makino, T., Sengoku, S., Lim, Y., Natori, T., & Kodama, K. (2020). Research on pharmaceutical product life cycle patterns for sustainable growth. *Sustainability, 12*(21), 8938. https://doi.org/10.3390/su12218938

19. Mousavi, A., Mohammadzadeh, M., & Zare, H. (2022). Developing a system dynamic model for product life cycle management of generic pharmaceutical products: Its relation with open innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 8*(1), 14. https://doi.org/10.3390/joitmc8010014

20. Prajapati, V., & Dureja, H. (2012). Product lifecycle management in pharmaceuticals. *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing, 12*(3), 150 - 158. https://doi.org/10.1177/1745790412445292

21. Kvesic, D. Z. (2008). Product lifecycle management: Marketing strategies for the pharmaceutical industry. *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing, 8*(4), 293 - 301. https://doi.org/10.1057/jmm.2008.23

22. Kesselheim, A. S. (2013). Rising health care costs and life-cycle management in the pharmaceutical market. *PLOS Medicine, 10*(6), e1001461. https://doi.org/10.1371/journal.pmed.1001461

23. Murteira, S., Ghezaiel, Z., Karray, S., & Lamure, M. (2013). Drug reformulations and repositioning in pharmaceutical industry and its impact on market access: Reassessment of nomenclature. *Journal of Market Access & Health Policy, 1*(1), 21131. https://doi.org/10.3402/jmahp.v1i0.21131

24. Koch, M. A., Juhnke, C., Moran, N., & Audibert, G. (2015). Pharmaceutical market access: Current state of affairs and key challenges. Results of the Market Access Launch Excellence Inventory. *Journal of Market Access & Health Policy, 3*(1), 29679. https://doi.org/10.3402/jmahp.v3.29679

25. Ganguli, A., Clewell, J., & Shillington, A. C. (2016). The impact of patient support programs on adherence, clinical, humanistic, and economic patient outcomes: A targeted systematic review. *Patient Preference and Adherence, 10*, 711 - 725. https://doi.org/10.2147/PPA.S101175