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Building Bridges: The Impact of Medical Science Liaison and Advanced Practice Provider Collaborations

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Abstract

Collaboration between medical science liaisons (MSLs) and advanced practice providers (APPs) is essential for advancing oncology care in an increasingly complex treatment landscape. Medical science liaisons serve as scientific resources, engaging in non-promotional exchange, delivering tailored education, supporting clinical research, and gathering real-world insights. These interactions help APPs stay current with evolving standards of care, interpret clinical trial data, and address knowledge gaps, while APPs provide perspectives that inform medical strategy and research priorities. This article outlines the origins and responsibilities of the MSL role, clarifies distinctions from commercial functions, and explores key pillars of collaboration: clinical research, medical education, and insight gathering. Through practical examples, it demonstrates how effective partnerships between MSLs and APPs bridge the gap between scientific innovation and clinical application, ultimately improving patient outcomes.

Collaboration between medical science liaisons (MSLs) and advanced practice providers (APPs) is essential in today's complex cancer care environment. Effective partnerships enhance clinical practice, broaden awareness of therapies, and improve patient outcomes through education, research, and scientific exchange. As oncology treatments and guidelines become increasingly sophisticated, APPs need timely, evidence-based information and real-world data. Medical science liaisons meet these needs by providing tailored education, supporting clinical trials, and interpreting emerging data. In turn, these activities enable APPs to make informed decisions and communicate effectively with patients. However, challenges such as time constraints, misconceptions about the MSL role, and APP

reluctance can hinder collaboration. This article clarifies the functions and value of MSLs, drawing on insights from APPs who have transitioned into the MSL role, to strengthen partnerships that advance patient care.

UNDERSTANDING THE MSL ROLE

Origins and Evolution

The MSL role was introduced in 1967 by Upjohn Pharmaceuticals to provide scientifically trained field staff who could serve as credible scientific peers and resources for health-care professionals (HCPs). Initially focused on therapeutic expertise and relationship building, the role has evolved to encompass clinical trial support, medical education, and insight gathering across diverse organizational settings (Pellett & Snyder, 2025; The MSL Society, 2023).

Current Responsibilities and Expertise

Medical science liaisons, also referred to as medical affairs specialists, scientific liaisons, or clinical science liaisons, are integral to medical affairs divisions within pharmaceutical, biotechnology, and medical device companies. They typically hold advanced scientific credentials, often as APPs, physicians, or PhDs, bringing clinical and research experience to their work. This expertise enables MSLs to deliver education on disease states, therapeutic agents, and clinical trial data throughout the product life cycle. Additionally, MSLs play a pivotal role in supporting research initiatives and facilitating clinical trial activities (Pellett & Snyder, 2025; The MSL Society, 2023).

DISTINGUISHING MEDICAL AFFAIRS FROM COMMERCIAL FUNCTIONS

Non-Promotional Nature of MSL Activities

There is a common misconception that the MSL role resembles sales; however, MSLs function in a fundamentally different capacity. Commercial teams focus on on-label product promotion through detailing, marketing activities, and sample distribution, whereas MSLs operate exclusively in a scientific, non-promotional role. Their responsibilities center on delivering objective, evidence-based information, identifying unmet clinical needs, and supporting clinical research. This scientific focus enables MSLs to serve as trusted medical affairs professionals who connect industry with the health-care community through balanced, clinically relevant knowledge exchange (The MSL Academy, 2025; Pellett & Snyder, 2025).

Compliance Boundaries and Off-Label Requests

Collaboration between medical affairs (e.g., MSLs) and commercial teams must adhere to strict compliance standards. While commercial teams provide information on a product's approved label, MSLs, in contrast, can address unsolicited, medically driven off-label questions under regulatory guidance. This distinction underscores the scientific, non-promotional nature of the MSL role (Aguirre Lara, 2025; Laurent, 2025). Examples of MSL activities are outlined in Table 1.

SCIENTIFIC EXCHANGE: THE CORE OF COLLABORATION

Scope of Scientific Discussions

Scientific exchange is central to every MSL-APP interaction, whether in person, virtually, or by phone. All exchanges are governed by law through FDA regulations and anti-kickback statutes, ensuring that information is accurate, unbiased, and non-promotional (Aguirre Lara, 2025; Vanderhoef et al., 2020). Topics include disease-state education, treatment landscapes, clinical trial updates, and safe therapeutic use (Theron et al., 2021). For example, when an APP asks about a new therapy, an MSL may present relevant clinical trial data and tailor the discussion to the APP's patient population and practice needs.

Managing Unsolicited Off-Label Requests

When APPs inquire about unapproved uses, such as use of a product in a patient population not included in the label or using a drug dose that differs from the recommended prescribing information, MSLs follow a structured, compliant process: they confirm the unsolicited nature of the question, review the product's approved indications, and provide balanced scientific information supported by available evidence. This capability not only distinguishes MSLs from commercial roles but also enhances APPs' clinical decision-making by providing the balanced, evidence-based context needed to evaluate treatment options beyond the confines

Table 1. Medical Science Liaison Dos and Do Nots

Do	Do not
• Do establish and maintain relationships with HCPs, including MDs, APPs, PharmDs, RNs, and research staff • Do engage in scientific exchanges about: » Product science, drug mechanism of action, clinical trial data » Treatment landscape and clinical practice patterns » Unmet needs and research gaps » Research collaborations » Pipeline discussions • Do provide fair, balanced education and training to HCPs on disease state management, product information, and clinical trial data • Do provide clinical trial support • Do address unsolicited and off-label information requests • Do gather insights from HCPs to help inform medical strategy	• Do not participate in any promotional activity relating to a drug or medical device, including: » Drug or device sales or promotion » Samples or voucher distribution » Meals to large groups or non-clinical staff » Speaker programs (dinner events aimed at promoting the use of a drug or device) • Do not limit discussions to on-label content (i.e., prescribing information) • Do not provide support at a commercial booth at a conference • Do not provide patient access or support • Do not give medical advice or opinions about patient care management • Do not attempt to influence or persuade a provider to prescribe a drug or device • Do not provide input or recommendations for investigator-initiated clinical trials

Note. HCP = health-care provider; MD = Doctor of Medicine; APP = advanced practice provider; PharmD = Doctor of Pharmacy; RN = registered nurse. Information from Aguirre Lara (2025); Laurent (2025); The MSL Academy (2025); Pellett & Snyder (2025).

of the approved label (Laurent, 2025; Vanderhoef et al., 2020).

Impact on Clinical Decision-Making

Medical science liaisons play a meaningful role in strengthening APP clinical decision-making by helping providers integrate emerging data into practice safely and effectively (Theron et al., 2021). Through unbiased scientific exchange, MSLs ensure APPs have access to accurate, up-to-date evidence that supports sound clinical judgment and ultimately improves patient care (Vanderhoef et al., 2020).

PILLARS OF MSL-APP COLLABORATION

MSL-APP partnerships center on three pillars: clinical research, medical education, and insight gathering. These pillars form the foundation of a strategic, bidirectional relationship. For APPs, collaboration provides access to timely, evidence-based information, opportunities to participate in research, and tailored education that adds value to clinical practice and supports clinical decision-making. For MSLs, partnership offers real-world insights that inform medical strategy, identify unmet needs, and guide future research priorities. Together, these interactions bridge scientific innovation and clinical application, ultimately improving patient care (Chen et al., 2024).

MSL-APP COLLABORATION IN CLINICAL RESEARCH

From Discovery to Clinical Use

Drug development is a multistep process that begins with translational research and preclinical studies to evaluate biological activity, safety, and efficacy. Once sufficient data support human testing, the program advances through the clinical trial phases (Kandi & Vadakedath, 2023; Figure 1).

In phase I, first-in-human studies are conducted in a small number of patients to assess safety, tolerability, and pharmacokinetics. These trials aim to establish an appropriate dose for phase II. Phase II includes a slightly larger patient population than phase I, but not as large as phase III. These trials evaluate preliminary efficacy and further characterize safety. They are often single-arm (non-comparator) studies. Phase III trials are large-scale trials that confirm efficacy and safety in a larger number of patients and compare the investigational therapy to the current standard of care. Successful results lead to regulatory submission and approval. Phase IIIb and IV trials are conducted before and after regulatory approval to address additional questions, monitor long-term

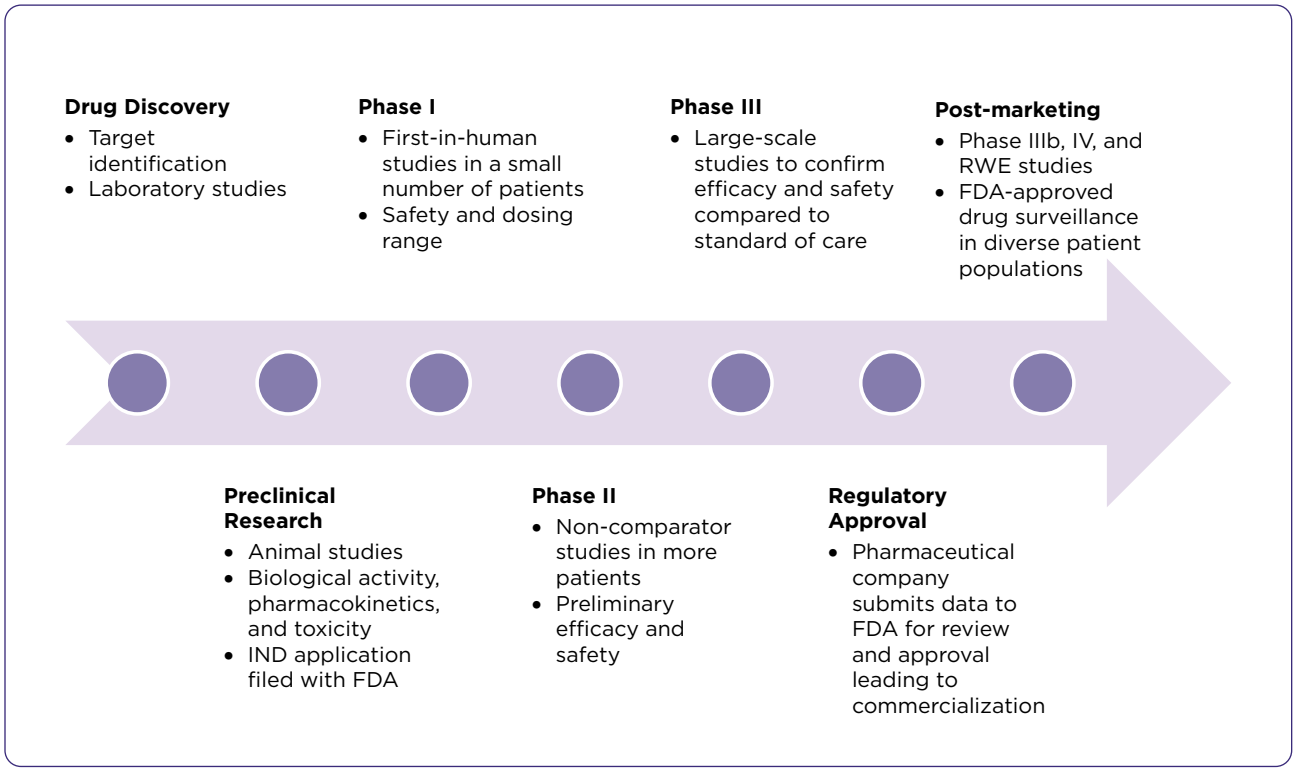

Figure 1. Drug development process. IND = investigational new drug; RWE = real-world evidence. Adapted from Kandi & Vadakedath (2023).

safety, and evaluate expanded indications. Real-world evidence (RWE) is gathered from post-approval studies assessing effectiveness, safety, and treatment patterns in routine clinical practice.

Roles Across Trial Phases

Medical science liaisons play a critical role in supporting clinical trials through site initiation, patient enrollment, and ongoing operations. On the other hand, APPs often serve as principal investigators (PIs) or sub-investigators (Sub-Is), depending on institutional policies and practices. While their roles are distinct, MSLs and APPs collaborate closely, combining scientific expertise with strategic insight to optimize clinical practice settings and leverage APP strengths. This partnership fosters a valuable exchange of information that can ultimately improve patient outcomes. Building such relationships requires collective skills rooted in trust and credibility. When these foundations are strong, collaboration enhances workflows and drives optimal patient care. See Table 2 for MSL and APP activities in clinical research (Theron, 2021).

MSL-APP COLLABORATION IN MEDICAL EDUCATION ACTIVITIES

Addressing Knowledge Gaps

In the rapidly evolving field of oncology, APPs must stay current with the latest research, advancements, and standards of care. Yet, many APPs, especially those new to oncology, face challenges such as limited oncology-specific education and the intense demands of clinical practice. These learning gaps create barriers to maintaining and delivering up-to-date, evidence-based care (Advanced Practitioner Society for Hematology and Oncology, n.d.).

Medical science liaisons help bridge these challenges by providing targeted, peer-level education on disease states, therapies, and clinical data. Through group sessions and individualized engagements, MSLs equip APPs with the essential scientific knowledge that strengthens their core competency, thus supporting their ability to deliver high-quality, up-to-date care. This collaboration is mutually beneficial: APPs gain access to timely, unbiased information and

Table 2. Clinical Trial Activities and MSL-APP Collaboration

Clinical trial activity	Description	MSL-APP collaboration
Study start-up	Multistep process focused on establishing the infrastructure, approvals, and workflows needed to conduct a clinical trial. SSU activities are typically led by research and operations teams.	MSLs support SSU by providing scientific background and clarifying protocol rationale, while APPs offer input on feasibility, workflow implications, and patient population. This collaboration helps align trial design with real-world practice.
Site identification	Identification of potential clinical trial sites with appropriate expertise, infrastructure, patient populations, and operational capabilities.	Strong MSL-APP relationships enable MSLs to accurately represent a site's capabilities, patient demographics, and research track record. APPs share information on patient volumes, referral patterns, and clinical focus to support site nomination.
Site selection visit	Sponsor visit to evaluate a potential site's ability to conduct a specific trial, including staffing, processes, and experience.	APPs contribute to protocol review, focusing on inclusion and exclusion criteria, unmet needs, and fit with their patient population. MSLs help contextualize the science and facilitate discussions between the sponsor and clinical team.
Site initiation	Meeting to ensure investigators and research staff are familiar with the protocol, procedures, documentation requirements, and regulatory obligations before enrollment begins.	APPs may serve as principal investigators (PIs) or sub-investigators (Sub-Is) depending on institutional policies. During site initiation, MSLs answer scientific questions, clarify study endpoints, and support APPs in understanding protocol nuances.
Study activation and conduct	Formal opening of the study to screening and enrollment, followed by ongoing treatment and follow-up visits as defined in the protocol.	APPs are often central to patient identification, screening, consent, and day-to-day trial management. MSLs provide ongoing scientific support (e.g., clarifying protocol criteria or data-related questions), helping APPs optimize enrollment and patient safety.
Study completion and data analysis	Completion of patient enrollment and treatment, final data collection, data cleaning, and statistical analysis of primary and secondary endpoints. Results are then disseminated through abstracts, presentations, and peer-reviewed publications.	APPs offer practical insights into patient experiences and real-world implementation of the protocol. MSLs help interpret and communicate study outcomes and may collaborate with investigators on abstracts or presentations that highlight site-level experience.
Regulatory approval and post-approval phase	Regulatory review and approval of new drugs or indications by authorities such as the US FDA, followed by integration of new therapies into clinical practice.	Post-approval, MSLs communicate key clinical and safety data and support APPs in understanding the label and clinical implications. APPs share early real-world experiences, unmet needs, and implementation barriers, which MSLs relay internally to guide future studies and educational efforts.

Note. SSU = study start-up; MSL = medical science liaison; APP = advanced practice provider. Information from Kandi & Vadakedath (2023).

practical guidance, while MSLs deepen their understanding of real-world clinical challenges, enabling them to tailor educational resources and identify unmet needs that inform medical strategy.

Interpreting and Applying Clinical Data

Interpretation of research data often becomes meaningful only when applied in real-world settings. Medical science liaisons bridge this gap by helping APPs assess and understand statistical results. During scientific exchanges, MSLs review pertinent data points and aspects of clinical trials that impact clinical care, including study rationale and trial design, inclusion and exclusion criteria, primary and secondary endpoints, relative and absolute risk reduction, incidence and types of adverse events, subgroup analyses of specific patient populations, and short- and long-term follow-up data. These discussions empower APPs to translate complex data into actionable decisions that improve patient care.

Educational Scope

Medical science liaisons provide education on disease states, drugs, genomic assays, and medical devices. Topics related to drugs include mechanisms of action, pharmacokinetics, drug-drug interactions, efficacy, and safe use in specific populations, while education on genomic assays may highlight how utilization can inform treatment decisions and patient care. Medical science liaisons also address unsolicited off-label questions about products (uses not specified in the FDA label), which must be addressed ethically while maintaining compliance with industry regulations (Aguirre Lara, 2025; Laurent, 2025). By tailoring educational support to each APP's needs, MSLs fill knowledge gaps, thus ensuring APPs have the necessary information to make accurate, confident treatment decisions (Theron et al., 2021).

Examples of MSL-Led Education

An example of MSL-led education is a small-group "lunch and learn" session that provides APPs with comprehensive updates on new therapies and practical management strategies, which fosters peer learning and keeps clinicians current with evolving treatment landscapes. Another example is a one-on-one in-person meeting with an APP to address a specific question about managing liver toxicities, where the MSL delivers tailored guidance based on clinical data. These scenarios illustrate how MSLs adapt education to meet both broad and individualized needs (Tables 3 and 4).

INSIGHT GATHERING: DRIVING STRATEGY THROUGH REAL-WORLD PERSPECTIVES

Why Insights Matter

Insight gathering is not only a core responsibility of MSLs but also a mutually beneficial process that strengthens collaboration. For APPs, sharing insights provides an opportunity to influence research agendas, trial design, and educational resources tailored to real-world needs. For MSLs, these conversations yield actionable feedback that informs medical strategy and identifies gaps in care (Pellett, 2024; Dwyer, 2024).

Formats for Insight Gathering

Insights are captured through multiple formats, including one-on-one meetings, small-group roundtables, clinical trial collaborations, and interactions at medical congresses. Gathering insights through multiple channels helps MSLs understand the evolving barriers, questions, and decision-making factors that shape APPs' real-world patient care.

Real-World Examples

For example, at a recent oncology congress, APPs highlighted barriers to enrolling older patients in clinical trials, such as comorbidities and travel logistics. This feedback prompted exploration of decentralized trial options and development of geriatric oncology education materials. In another instance, during a post-education follow-up, an APP expressed concern about managing immune-related adverse events in rural settings. The MSL escalated this insight internally, resulting in a targeted educational webinar and resource toolkit for community oncology practices. These examples illustrate how insight gathering drives meaningful change for both APPs and the broader health-care ecosystem.

Table 3. Example of MSL-APP Collaboration in a Medical Education Initiative

Step/activity	Description	Value to APPs and patient care
Session planning	MSL coordinates a 30-minute virtual "lunch and learn" for general oncology APPs on a new ovarian cancer therapy.	Delivers targeted, relevant education tailored to APP practice needs.
Disease and treatment review	Brief overview of ovarian cancer epidemiology, disease burden, current treatment approaches, and gaps in care.	Provides clinical context and highlights unmet needs.
Therapy overview	Introduction of the new agent, including mechanism of action, molecular targets, and placement within treatment lines.	Clarifies where, when, and how to use the therapy appropriately.
Safety and management	Review of safety profile, key adverse events, and practical management strategies.	Equips APPs to manage patient safety proactively and confidently.
Clinical data review	Summary of pivotal phase III data, relevant real-world evidence, and subgroup analyses.	Keeps APPs current with the latest evidence and guideline-concordant care.
Interactive discussion and Q&A	APPs discuss patient selection, logistical barriers, and real-world scenarios.	Fosters peer learning and addresses practical clinical challenges.
Follow-up education	Optional follow-up session focused on dosing, monitoring, side-effect management, and ongoing questions.	Provides continued support and reinforces key concepts over time.
Insight gathering	MSL documents APP feedback on challenges, barriers, and unmet needs and shares de-identified insights internally.	Informs future education offerings and broader medical strategy.

Note. MSL = medical science liaison; APP = advanced practice provider.

Table 4. Example of MSL-APP Medical Education: Adverse Event (AE) Medical Inquiry Pathway

Step/activity	Description	Value to APPs and patient care
Inquiry received	APP contacts the MSL with a question about liver AE management for a specific drug.	Ensures APPs have access to timely, expert medical support.
Meeting scheduled	MSL arranges an in-person meeting with the APP after clinic hours.	Provides personalized, convenient education tailored to the APP's schedule.
Safety profile review	MSL presents slides detailing incidence, time of onset, duration, grading, and recommended management of liver AEs.	Delivers clear, concise safety information that supports risk recognition.
Management strategies	MSL discusses practical approaches for monitoring, dose modifications, and managing liver AEs.	Equips APPs to prevent, detect, and manage adverse events.
Q&A and case discussion	APP asks follow-up questions and reviews specific patient scenarios with the MSL.	Addresses real-world clinical challenges and refines decision-making.
Resource sharing	If requested by the APP, the MSL provides slides and additional education resources for future reference and team use.	Supports ongoing learning and dissemination within the APP's practice.
Insight gathering	MSL documents APP feedback and perceived gaps in guidance or support and relays deidentified insights internally.	Informs future education materials, safety communications, and support initiatives.

Note. MSL = medical science liaison; APP = advanced practice provider.

CONCLUSION

Effective collaboration between MSLs and APPs is essential for advancing patient-centered oncology care. By combining the scientific expertise of MSLs with the clinical insights of APPs, these partnerships bridge the gap between research and real-world practice, ensuring that evidence-based innovations translate into meaningful outcomes for patients. When APPs and MSLs engage in open, compliant, and strategic dialogue, they create a dynamic exchange that drives education, informs research, and shapes future therapeutic landscapes. Strong collaboration empowers both roles to deliver the highest standard of care in an increasingly complex oncology environment. Advanced practice providers who wish to stay informed on emerging data and best practices may benefit from engaging with MSLs as a scientific resource.

Disclosure

Dr. Albert, Dr. Byers, and Ms. Boggs are employees of Novartis.

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