

CASE REPORT

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Case Report

Primary Disciplinary Field(s): Medicine, Psychology, Epidemiology, Health Sciences

1. Core Definition

A **Case Report** (CR) is a comprehensive, detailed document outlining the clinical findings, diagnostic process, treatment, response to therapy, and subsequent follow-up of a single patient or, occasionally, a small group of patients (known as a Case Series). The fundamental purpose of a case report is to communicate unique or unusual clinical observations that deviate significantly from standard presentations or expected outcomes. As noted in foundational definitions, the case report serves as a detailed and descriptive record covering the complete trajectory of an individual's medical or psychological health, providing a critical reference point for scholarly discussion and future diagnosis. This documentation is crucial because it often captures novel clinical phenomena that might be too rare or too specific to be identified through large-scale clinical trials or systematic reviews.

The report acts as a cornerstone of clinical communication, synthesizing disparate pieces of information into a coherent narrative structure. The data collected encompasses virtually every record relevant to the case. This mandatory inclusion features the patient's initial presentation, observed **signs and symptoms**, detailed outcomes of **laboratory and diagnostic tests**, differential and definitive **diagnoses**, rigorous descriptions of the chosen **treatment** modalities (including surgical, pharmaceutical, or psychological interventions), specific **medications** administered, and structured **recommendations for follow-up** care. Unlike randomized controlled trials (RCTs), which prioritize generalizability and statistical power, the case report prioritizes depth and specificity concerning a unique occurrence, highlighting the complexity and individuality inherent in clinical practice.

The academic value of a well-written case report lies in its fidelity to the clinical timeline and its capacity to offer timely insights into disease pathogenesis, adverse events, or therapeutic efficacy under highly specific, non-replicable circumstances. While traditionally positioned lower in the hierarchy of medical evidence, the case report maintains essential utility as a primary generator of scientific hypotheses, serving as an early alert system that draws the wider medical community's attention to potential emerging health issues before they become statistically significant trends or widespread epidemics.

2. Etymology and Historical Development

The practice of meticulously recording individual patient cases is deeply rooted in the history of medicine, predating the establishment of modern statistical methods and large-scale clinical

research. Early examples of detailed case documentation can be traced back to ancient medical texts, such as the Egyptian Ebers Papyrus (c. 1550 BCE) or the clinical observations documented by Hippocrates (c. 460-370 BCE), who famously emphasized the necessity of accurate clinical descriptions for understanding disease progression and predicting prognosis. These foundational recordings established the empirical approach that underpins modern medical record-keeping, focusing intensely on observable phenomena and sequential documentation of a patient's course.

During the 17th and 18th centuries, prominent European physicians, including Thomas Sydenham and Giovanni Battista Morgagni, formalized the scholarly practice of publishing specific, interesting cases. They viewed these narratives as crucial pedagogical tools for rapidly disseminating novel clinical knowledge. This period cemented the case report's role not just as a medical record, but as a mechanism for medical education and structured scientific discourse. Documentation often included descriptive narratives linked to findings from autopsies, which allowed practitioners to correlate observed symptoms during life with specific anatomical findings post-mortem, significantly advancing the understanding of disease etiologies and pathological processes.

The 20th century witnessed the ascendancy of evidence-based medicine (EBM) and the corresponding prioritization of statistically powerful study designs, particularly the randomized controlled trial. As a result, the case report experienced a shift in its perceived status, transitioning from the principal source of medical knowledge to a preliminary form of evidence. However, its importance remains paramount in identifying specific, unpredictable events, most notably in the field of pharmacology. Initial reports of novel or rare adverse drug reactions (ADRs) frequently appear first as published case reports, initiating regulatory scrutiny and subsequently triggering the execution of large-scale safety studies.

3. Structure and Required Components

To ensure maximum clarity, reproducibility, and scientific rigor, modern academic journals typically mandate that case reports adhere to a highly structured format. This format is often guided by standardized frameworks such as the CARE (CAse REport) guidelines, developed through international consensus to standardize the reporting of individual patient cases. Adopting a standardized structure ensures readers can efficiently identify the novelty, relevance, and clinical applicability of the documented case. A typical report is sequentially divided into several mandatory sections, commencing with a concise, informative title and an abstract summarizing the unique features and key conclusions.

The primary body of the report usually begins with a comprehensive **Introduction**, which establishes the clinical context, summarizes relevant existing literature, and clearly articulates why this specific case warrants publication--this being the crucial 'takeaway message.' This is followed by the central narrative section, the **Patient Presentation**. This section mandates the inclusion of

non-identifying demographic information, the patient's chief complaints, a detailed medical and family history, findings from the physical examination, and the initial differential diagnoses considered by the clinical team. This presentation must rigorously maintain patient confidentiality while providing sufficient clinical detail to allow for critical evaluation and potential replication by other clinicians.

Subsequent essential sections cover the **Diagnostic Assessment**, meticulously detailing laboratory results, imaging data, and specific procedural outcomes used to arrive at the final diagnosis. The **Treatment** section provides a comprehensive description of the interventions administered, including specific medication dosages, treatment duration, and the rationale justifying the chosen therapy. Crucially, the **Discussion** section interprets the case findings in light of the current scientific knowledge, proposing explanatory mechanisms underlying the unusual presentation or outcome, and addressing the broader implications for clinical practice or necessary future research. Finally, the **Conclusion** summarizes the main teaching points and often includes specific, actionable follow-up recommendations, reinforcing the report's utility as a comprehensive record.

4. Types of Case Reports and Applications

Although the core structural elements remain consistent, case reports serve various specialized functions across diverse medical and psychological disciplines, leading to categorization based on their primary academic or clinical objective. The most prevalent category involves documenting **rare diseases** or highly atypical manifestations of common diseases. These reports are fundamentally important for cataloging the wide phenotypic variability of human illness, providing essential diagnostic clues for clinicians encountering similar obscure or previously unknown presentations in their practice.

A second, equally critical type focuses on the reporting of **novel therapeutic interventions** or highly unusual patient responses to established therapies. When a patient exhibits a dramatic and unexpected recovery, or conversely, a unique resistance to standard treatment protocols, the case report formally documents this observation, potentially leading to the generation of new hypotheses concerning drug mechanisms, resistance patterns, or patient-specific genetic factors. Furthermore, case reports are instrumental in capturing unexpected **adverse events**, idiosyncratic reactions, or toxicity associated with established medications, medical devices, or complex psychological therapies. These spontaneous, early reports function as the first major alert signal to international regulatory bodies regarding critical patient safety issues.

A related entity, the **Case Series**, represents an aggregated form of case reporting, documenting similar findings across a small group of patients, typically ranging from 2 to 10 individuals. While still occupying a lower position in the evidence hierarchy compared to systematic reviews, a case

series offers slightly greater generalizability than a single case report. This format is particularly effective in demonstrating the consistency of a novel finding, such as the initial efficacy profile of a new surgical technique, or delineating the common presentation patterns of a newly identified infectious agent or clinical syndrome across multiple individuals.

5. Significance in Hypothesis Generation and Education

Notwithstanding their recognized methodological constraints, case reports hold profound significance as the initial building blocks of the scientific discovery process. They are powerful, indispensable tools for **hypothesis generation**. If a clinician observes a previously unforeseen association between two variables--such as a specific, newly marketed medication appearing to induce a rare neurological side effect--the case report formally documents this critical observation. This documentation compels researchers to design subsequent, larger observational studies (such as cohort or case-control studies) or even Randomized Controlled Trials (RCTs) to test the proposed hypothesis statistically and validate the association. Historically, many groundbreaking medical discoveries, including the initial clinical descriptions of conditions like AIDS, Creutzfeldt-Jakob disease, and the identification of the severe teratogenic effects of drugs like thalidomide, were first documented and disseminated through published case reports or small, localized case series.

In the crucial fields of **medical and psychological education**, case reports are invaluable pedagogical assets. They offer students, residents, and trainees a detailed, narrative exposure to the complex reality of clinical reasoning, differential diagnosis, and management in scenarios that academic textbooks often oversimplify. By reviewing a published case report, the reader actively practices the intellectual process of integrating diverse clinical signs, interpreting diagnostic data, and evaluating therapeutic responses, effectively bridging the persistent gap between theoretical knowledge and practical clinical application. They serve as rich, contextual learning instruments, illustrating not only diagnostic dilemmas but also the critical ethical and logistical challenges inherent in advanced patient care.

Moreover, the cumulative effect of high-quality case reporting contributes directly to the refinement and evolution of **diagnostic criteria** and disease classification systems. When a critical mass of case reports documents a consistent, unusual clustering of signs and symptoms that current systems fail to categorize, medical authoritative bodies (such as the World Health Organization or the American Psychiatric Association) may be prompted to revise existing disease classifications or formally recognize a novel syndrome or distinct disease entity. Thus, case reports function as a vital, real-time feedback loop originating from the clinical frontline, flowing back to the core research community and classification authorities.

6. Methodological Limitations and Debates

The primary and most frequent criticism leveled against the academic utility of the case report stems directly from its inherent methodological weakness, specifically its high susceptibility to various forms of **selection bias** and its extremely limited generalizability. Because the report focuses exclusively on a single, often exceptional or highly unusual patient presentation, the clinical findings cannot be reliably extrapolated to the general patient population. This constraint significantly limits its applicability for guiding broad clinical policy, establishing population-level efficacy, or determining definitive treatment protocols.

The process of publishing a case report is also profoundly affected by **publication bias**. Academic journals and editors are typically more inclined to publish cases demonstrating dramatic, positive, or highly unusual outcomes--a phenomenon sometimes referred to as "reporting the rare success"--rather than routine findings or cases where expected treatments failed. This systematic preference for exceptionality can inadvertently inflate the perceived success rate of novel treatments or exaggerate the rarity of certain complications. Consequently, a compilation of published case reports may present a skewed or distorted view of the actual frequency and reality encountered in everyday clinical practice.

A substantial ongoing debate centers on the issue of inferring causality. Since case reports inherently lack a contemporaneous comparison group (a control group) and rely entirely on observational, post-hoc data, they can only suggest a temporal or coincidental association between a specific intervention and a subsequent outcome, not a true, verifiable cause-and-effect relationship. The observed clinical change in the patient may, therefore, be attributable to numerous confounding factors, including spontaneous remission, a powerful placebo effect, or unmeasured external variables, rather than being definitively linked to the documented intervention. Due to these fundamental methodological limitations, the case report is almost universally assigned to the lowest tier (Level V) of the influential Hierarchy of Evidence in evidence-based medicine frameworks.

7. Ethical Considerations and Reporting Standards

The production and dissemination of case reports necessitate careful adherence to stringent **ethical guidelines**, particularly concerning the imperatives of patient confidentiality and the requirement for explicit informed consent. Since the case narrative inherently involves highly specific, unique, and often sensitive medical details, there is a serious risk that the patient could potentially be identified by peers or the public, even if all traditional demographic identifiers (name, initials, address) are meticulously omitted. Therefore, obtaining explicit, written **informed consent** from the patient (or their legally authorized guardian) for the publication of their detailed clinical data and associated images is an absolute, non-negotiable requirement for ethical academic

reporting.

In response to the identified weaknesses and the need for enhanced reporting consistency, numerous national and international organizations have collaboratively developed formalized publishing standards. The most widely adopted and referenced framework is the aforementioned CARE guideline, which provides a comprehensive 30-item checklist. This checklist compels authors to ensure that all critical components--including a precise patient history, an accurate timeline of events, detailed documentation of diagnostic challenges, and a clear, evidence-based rationale for the discussion--are systematically and transparently addressed. The widespread adoption of standards like CARE aims to fundamentally mitigate methodological weaknesses by demanding maximal rigor in documentation and complete transparency in the interpretation of findings, thereby ensuring the case report contributes its highest potential value to the global body of medical knowledge.

Further Reading

[Case report - Wikipedia](#)

[The CARE Guidelines: Consensus-based clinical case reporting guideline development](#)

[Agency for Healthcare Research and Quality \(AHRQ\): Levels of Evidence](#)

[Adverse Drug Reaction - Wikipedia](#)

[Hippocrates - Wikipedia](#)