Evidence Trends in Remote Patient Monitoring and Remote Therapeutic Monitoring

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Med-Tech Innovation

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Poster #MT33

OBJECTIVE

To provide an overview of trends in the current evidence landscape of products and services in development that support remote patient monitoring (RPM) and remote therapeutic monitoring (RTM), given the release of new billing codes for RPM and RTM by Centers for Medicare and Medicaid Services (CMS) in 2019 and the continuing trend of gradually expanding coding and payment for remote services.

INTRODUCTION

Remote physiologic monitoring (RPM) and remote therapeutic monitoring (RTM) have become increasingly more desirable methods for delivering healthcare to patients over the past several years. The delivery of healthcare in the digital space incorporates software and hardware devices and other services to monitor patients' health data remotely. Remote monitoring hardware typically includes FDA cleared medical devices such as wearables and biometric sensors, ingestible medication sensors, and connected drug delivery devices, and software generally encompasses smart phone application-based technologies such as lifestyle and wellness applications, medication adherence applications, or clinical interventions that are delivered directly to patients via digital communication practices to treat or prevent diseases and disorders. RPM and RTM technologies are set apart by two key differences: RPM data is physiologic and automatically recorded and transmitted, whereas RTM data can be non-physiologic and can be self-reported by patients. The first code (99091) was established in 2019 to facilitate reimbursement for reviewing data from home monitoring devices. Medicare has started to establish and refine codes more rapidly to meet growing demand and stay current with healthcare delivery requirements and trends. In 2022, CMS introduced musculoskeletal- and respiratory-specific RTM codes as a reaction to RPM codes. As the space continues to evolve, Medicare has started to establish and refine codes more rapidly to meet growing demand and stay current with healthcare delivery requirements and trends. There is an increasing need to understand both how providers can code and be paid for RTM and RPM healthcare delivery and to understand the evidence that drives changes in coverage and usage of healthcare in the digital space.

METHODS

A focused literature review was conducted in PubMed for articles published between January 1, 2013, and January 1, 2023. The key terms used for the search were "remote patient monitoring", "remote therapeutic monitoring", "remote physiologic monitoring". The PICOS for the search strategy is listed in Table 1. Studies were eligible for inclusion if technologies were classified as RPM or RTM. Articles were categorized using a semi-automated software platform (AutoLit, Nested Knowledge, St. Paul, MN) based on disease area, study design, intervention, and outcomes studied.

RESULTS

- Of the 673 records screened, 245 articles were included in the final analysis.
- The top disease areas being reviewed in these studies were cardiology (25.7%), coronavirus disease of 2019 (COVID-19; 11.4%), diabetes (9.4%), and pulmonary/respiratory disease (8.2%).
- Over the past 6 years (2017-2022), cardiology, diabetes, and pulmonary disease have consistently remained the most prominent focal areas for evidence generation with few exceptions. Since 2019, research also focused on exploring the benefits of using RPM and RTM in coronavirus disease.
  - Among all disease areas, cardiovascular remains the most researched; however, research into use of RPM and RTM with COVID has rapidly expanded.
- Observational studies (19.6%) were the most common study design, followed by systematic or focused literature reviews (11.0%) and narrative reviews (10.6%).
- The most frequent non-clinical outcomes reported in these studies were symptom monitoring (20.8%), all-cause readmission and hospitalization rates (both 7.3%), and patient experience (7.8%), respectively.
- The most common types of RPM and RTM modalities included hardware, software, telehealth, and blockchain applications; specific technologies were studied with generally the same frequency.
- Analysis showed that Europe had the greatest number of publications, followed by the U.S.

Table 1: PICOS Criteria

Criteria	Inclusion	Exclusion
Population	• Use of RPM or RTM technologies	• Non-RPM or RTM technology
Intervention/ Comparators	• Not Applicable	• Not Applicable
Outcomes	• Clinical and Nonclinical Outcomes	• Outcomes reported outside 10-year time frame
Study Design	• Prospective • Observational studies • Retrospective studies • Interventional studies • Database analyses • Registries • Systematic reviews & meta-analyses	• Papers describing study protocol for trials • Studies published before 2012

Figure 1: PRISMA Diagram

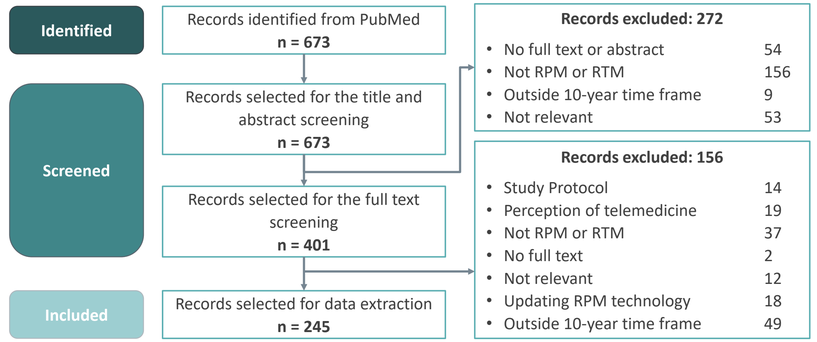
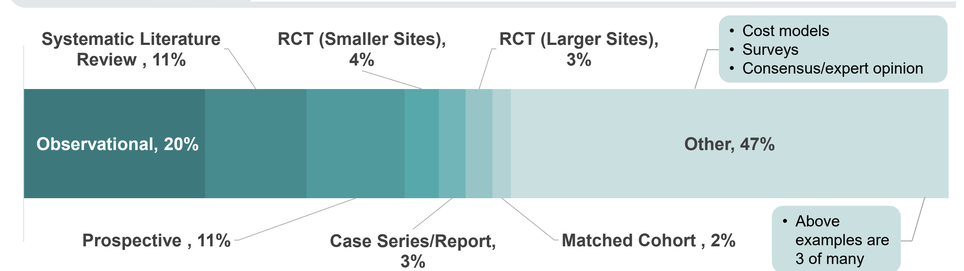


Figure 1: Papers Published

Figure 2: Top 5 Disease Areas* *Across all years*

Figure 3: Evidence Types *Across all years*

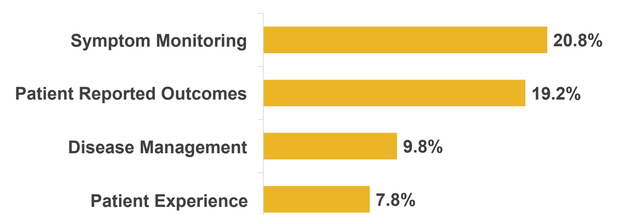


** Data are not mutually exclusive so totals may not be equal to 100% (e.g., papers may focus on multiple disease areas)*

DISCUSSION

Over the years, evidence generation for RPM and RTM adoption has increasingly grown in remote healthcare delivery, particularly during the COVID-19 pandemic. Recent code-set updates illustrate that CMS recognizes the current trends of RTM and RPM and is working diligently to support the demand as the expectation of these services continues to evolve. The expansion in existing literature also indicates an emerging interest in adoption of RPM and RTM and increased payer scrutiny of these types of care delivery methods. Although the last 5 years have been significant for RTM and RPM code development, CMS policy generation for RPM and RTM services has generally lagged, leaving latitude for additional evidence development to influence coding and coverage. It is expected that with the burgeoning demand for remote healthcare delivery, the establishment of codes and reimbursement practices will continue to develop for other disease areas potentially increasing all payor interests in this technology space.

Figure 4: Top 4 Outcomes Described* *Across all years*



CONCLUSION

CMS policy and coding practices for RPM and RTM are evolving, and this trend is likely to continue. This work provides details on the current evidence trends associated with RPM/RTM technologies. Evidence development of RPM and RTM should be assessed as evidence needs for coverage and reimbursement may receive increased payer scrutiny. As these services continue to evolve both in clinical area and product type, payers will likely look to more robust evidence to support positive coverage.