

# The Impact of Automated Peritoneal Dialysis (APD) with Remote Patient Management (RPM): Changing the Nursing Paradigm to Proactive Clinical Management

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## Background

Patients receiving APD are required to record details of their PD therapy and clinical data on a daily basis. This data is reviewed by the PD nurse at the time of the clinic visit as part of the overall patient assessment. The introduction of new APD cyclers embedded with two-way RPM technology offers the ability to monitor PD therapy, allowing nurses to view patients' dialysis details on a daily basis and/or make prescription changes remotely as needed. This technology enables nurses to review and proactively manage clinical issues and prescription changes, rather than manage care in what has heretofore been predominantly reactive. Two-way RPM provides opportunity for early intervention of dialysis-related issues and the ability to prioritize patients effectively.

## Objective

The aim of this study was to evaluate the impact of RPM on nurses' behavior and practice in the care of patients on APD at home. In particular, the study assessed if changing the frequency that the patient's dialysis details are remotely viewed by nurses impacts their ability to manage patients proactively. Difference in time taken to proactively versus reactively manage patients before or after the introduction of RPM was established within their hospital.

## Methods

Three PD nurses working in 3 UK hospitals were each observed for 2 working days using ethnographic research methodology. The same observer was used for consistency in documenting activities. The first observation day was performed before RPM was introduced; the second after RPM was established within their hospital (range 35-72 weeks-mean 57 weeks). During the observations, the time taken to complete each task by the nurse was recorded. Tasks were classified into 6 categories (Table 1); the tasks were further categorized as direct and indirect patient tasks. Direct and indirect tasks were then classified as proactive, reactive or routine (Figure 1). Direct tasks were defined as care of a patient provided personally by a staff member. Direct patient care may involve any aspects of the health care of a patient, including treatments, assessment, counseling, self-care, patient education, and administration of medication (face-to-face or by phone). Indirect services are rendered by the nurses for the benefit of a patient. Proactive tasks were initiated by the nurse in order to intervene regarding an issue before it is reported by the patient. Reactive tasks are in response to patient inquiry or at routine clinic visits. Routine tasks are those done repetitively for every patient during training and clinical evaluation i.e. BP reading, blood draw, post training follow-up phone calls.

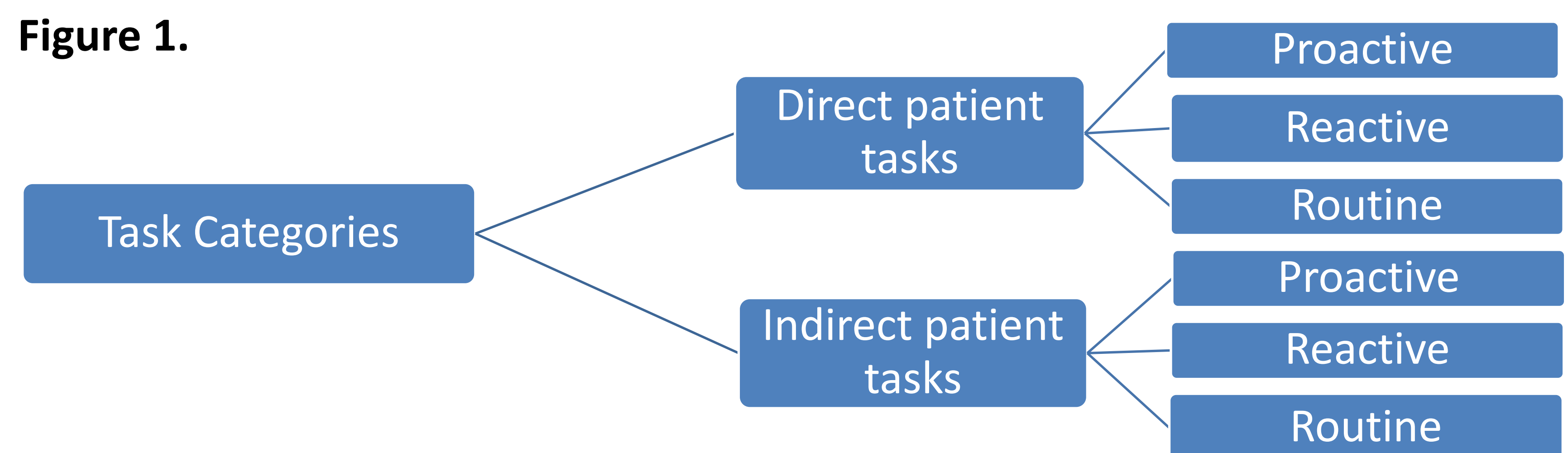
## Results

A total of 2,187 min (36 hrs and 27 min) of PD nursing time was observed across the 6 observations. 1,114 minutes were observed before RPM was introduced and 1,073 minutes after RPM was established. 84.95% pre-RPM and 75.77% of post-RPM time was spent with direct and indirect patient activities. Proactive patient care activities was 2% pre-RPM and 37% post-RPM. The categories of change from reactive to proactive direct and indirect activities can be found in Figure 3.

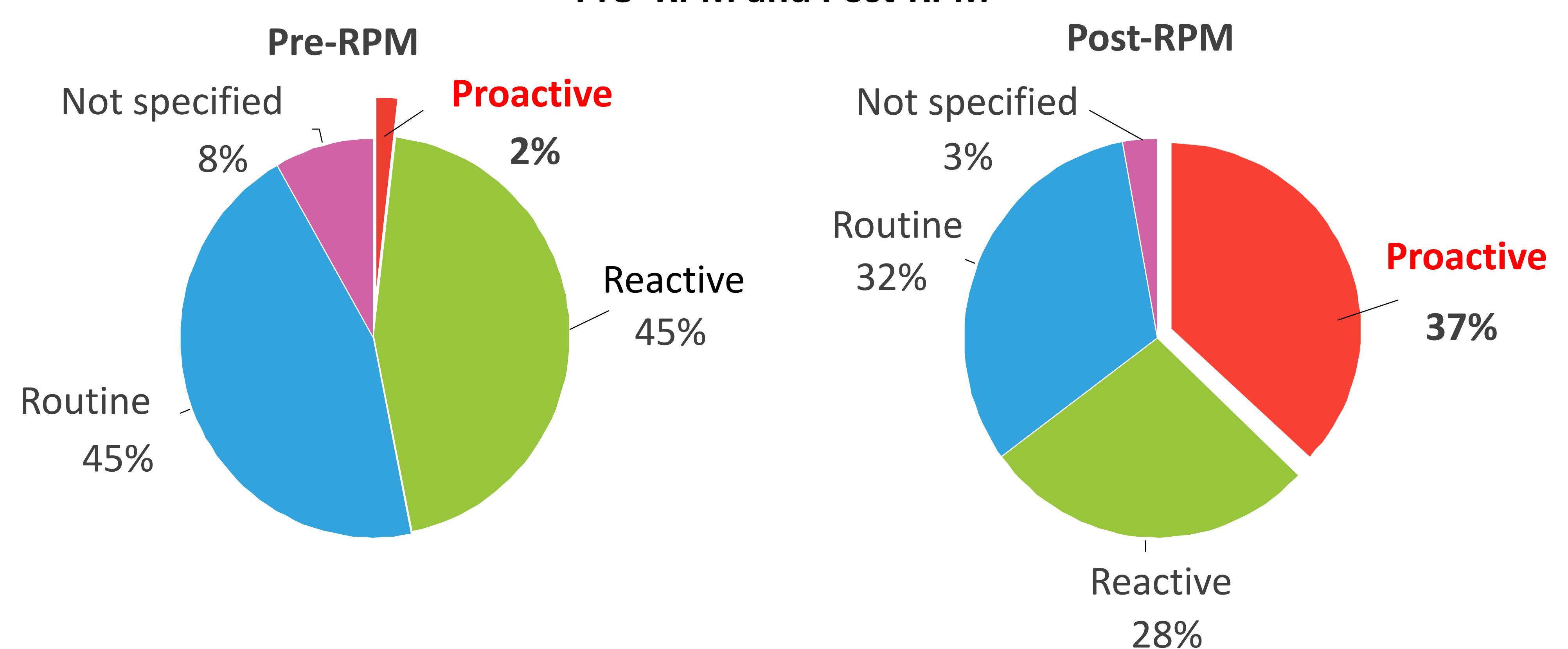
**Table 1. Categories-Direct and Indirect Tasks**

Task Categories	Tasks included	Direct Tasks	Indirect Tasks
Travel	Travel to routine patient home visits/ walking inside and outside of renal unit		X
Telephone	Patient and non-patient calls, scheduling tests, answering patient and care inquiries, pharmacy, lab results	X	X
Paper Handling/ Review	Reviewing patient clinic records, labs, emails, letters, tests, treatment details	X	X
Conversation	Administrative conversations, booking appointments, discussions between colleagues, pharmacy		X
Consultation (face to face)	Patient training, medication and treatment discussions, history and assessment, tests, blood draw, consents, results, answering questions, dialyzing	X	
Computer	Patient emails, letters, data input/results, patient daily records, medication update, forms, treatment details (reviewing and entering)		X

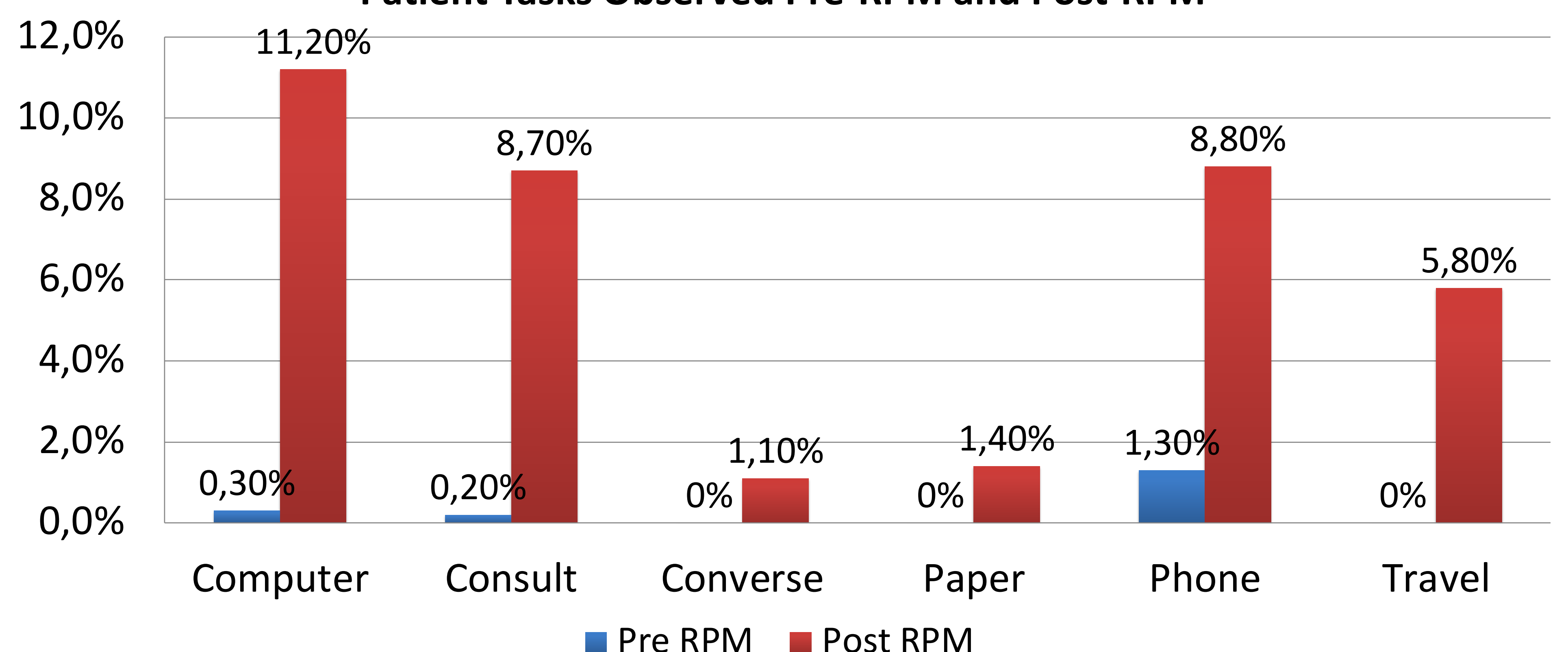
**Figure 1.**



**Figure 2. % Comparison of Time PD Nurses Spent Conducting Patient-Related Tasks Pre- RPM and Post-RPM**



**Figure 3. Comparison of % of Proactive Time Spent with Direct and Indirect Patient Tasks Observed Pre-RPM and Post-RPM**



## Conclusions

Establishing RPM in three UK hospitals has allowed PD nurses to spend 35% more of their direct and indirect patient activity time conducting proactive tasks. Information received on a daily basis should allow for earlier intervention and change in dialysis prescription in response to pertinent clinical issues. Routine tasks were reduced, potentially contributing to shift of PD nurses' behaviors away from reactive tasks, allowing better time management, and greater ability to prioritise their patients more effectively, both in the clinic and home visitation.