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# An exploratory study using video analysis of Rheumatology Specialist Nurses Conducting Methotrexate Education Consultations with Patients

SMR JS NA PH AH SR DW

Abstract

## **Background**

Prior to commencing Methotrexate patients routinely attend an education consultation with a rheumatology nurse. The purpose of the consultation is to discuss the patients' expectations and concerns related to commencing Methotrexate, the benefits of treatment, potential side effects and monitoring requirements. The aim of this study was to use video analysis to assess the structure, content and mode of delivery of the consultation.

## **Methods**

Video-recordings of ten patient-nurse consultations, involving four specialist rheumatology nurses were analysed and transcribed. The consultations were compared with the Calgary Cambridge consultation model. Transcripts were thematically analysed. Data were quantitatively assessed for verbal and non-verbal behaviours.

## **Findings**

Assessment of the video data using the CC model demonstrated good structure, content and flow of the consultation, influenced by the use of an information leaflet. Consultations generally consisted of communication from nurse to patient rather than a dialogue; the nurse spoke for 69% – 86% of the time; clarification of the patient's understanding of the information did not take place in any of the consultations. Thematic analysis also showed that the nurse agenda dominated and that the nurse was aware of "overloading" the patient with information. Cues from the patients to discuss items of importance were often missed.

## **Conclusion**

Video analysis can be used to identify aspects of the consultation that work well and those areas of the consultation that could be improved with specific training.

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## Introduction

Educating patients about their drugs is a central role of the specialist Rheumatology nurse (Royal College of Royal College of Nursing, 2009). Methotrexate is the most frequently initiated disease modifying antirheumatic drugs (DMARD) for both Rheumatoid Arthritis (RA) and Psoriatic Arthritis (PsA). Education about how to take it is particularly important, as the effects are delayed and side effects can be severe with a small but significant risk of death. Monitoring for side effects is therefore required (Harrison & Jones, 2014).

Traditionally, nurses have been peer-trained to undertake the role of educating patients about methotrexate. A national survey demonstrated that the training rheumatology nurses received was variable, with few nurses having completed any accredited training such as Masters level study (Robinson et al., 2017). Responses suggested that rheumatology nurses perceived that knowledge of methotrexate was the most important requirement for conducting the consultation with no acknowledgement of the need for shared decision making (Robinson et al., 2017). Confidence in educating patients on methotrexate was associated with gaining experience in delivering the consultation rather than informed by patient evaluation. A subsequent interview study of nurses suggested that during the consultation process nurses focused mainly on giving information which led to little opportunity for interaction and patient led discussion (Robinson et al., 2018).

There is no national framework to assess the competency of nurses carrying out consultations (Myatt, 2015). All nurses are required to seek professional revalidation every 3 years (Nursing and Midwifery Nursing and Midwifery Council, 2018) but the onus is on the nurse as to the role aspects included in the revalidation and this does not have to include competency in consultation skills. However, recently the Royal College of Nursing (2020) has published competencies for Rheumatology nurses which are beginning to be implemented into practice. Consultation models create the framework of the consultation and most are patient centric (Perry, 2011). Perry recognises that nurses will adapt and formulate their own consultation structure but seven key elements should be; establishing and maintaining a good rapport, structuring the consultation, obtaining and gathering relevant information, prioritising, clinical reasoning and judgement, information giving and management planning involving the patient. The Calgary-Cambridge consultation model (Kurtz & Silverman, 1996) was developed for medical professionals in primary care interactions and it has been widely adopted in undergraduate and post graduate teaching of consultation skills. Studies have shown that the

Calgary-Cambridge model can be adapted and applied to consultations conducted by nurse. In China, Yuan et al (2012) conducted a study with 70 junior nurses, 50% of the nurses were given consultation skills training based on the Calgary-Cambridge model and 50% were provided with standard learning materials. The nurses, who has received training in the Calgary-Cambridge model demonstrated improvement in observed communication and consultation skills. Donnelly et al (2016), in reference to a case study involving a patient receiving chemotherapy for lung cancer,describes how the use of the Calgary-Cambridge model resulted in more meaningful, empathetic communication between the nurse and patient in the palliative care setting. McLeish and Snowden (2017) acknowledge how the use of the Calgary-Cambridge model enhanced and provide direction to the consultation. Therefore, the Calgary-Cambridge model could offer structured guidance for the nurse consultation with patients regarding initiation of treatments such as methotrexate (Munson & Willcox, 2007).

Video recordings provide the opportunity to examine whether a particular consultation model is being used in practice as well as interpreting verbal and non-verbal interaction. verbal and non-verbal (Asan & Montague, 2014). V Multiple researchers are able to analyse the recordings, thus increasing inter-rater reliability. As recordings can be viewed numerous times, coding from different perspectives can be undertaken (Hiebert et al., 1999). The use of a video camera could be viewed as less intrusive than observation by a physically present individual. Video recordings may be particularly useful in the development of consultation skills with the opportunity for feedback and self-reflection to determine the extent to which shared decision making is integrated into consultations (Royal College of General Royal College of General Practitioners, 2017).

Shared decision making is a process where patients and healthcare providers consider the various treatment options and patient preferences to reach a health management decision which is based on mutual agreement (Frosch & Kaplan, 1999). The key principles of shared decision making involves a process that includes at least two participants, the patient and the healthcare professional. Additionally, this process could incorporate the patient's family and other healthcare professionals. Therefore, the nurse consultation is only part of the shared decision-making process.

## Aims

The main aim of this study was to explore the use of video analysis to observe, assess and inform the process of the nurse patient interaction.

A second aim was to identify whether there were any specific aspects of the consultation that would benefit from specific training in consultation skills.

## Methods

A convenience sample of ten consultations by four Specialist Rheumatology nurses in one rheumatology unit in England was chosen for the study. Data was collected via a mobile video camera which was set up on a tripod and placed in the consultation rooms. Ten videos were considered a pragmatic number for this study. Ethical approval to conduct the study was given by London-Brent Research Ethics Committee.

All patients had inflammatory arthritis and were attending a nurse-run clinic with a view to initiating methotrexate therapy. All were methotrexate naïve.

Patients were approached prior to the consultation and written consent was obtained before the video-recording. All participants were informed that the video recording could be stopped at any point, or they could withdraw consent and the video-recording would be destroyed. Recordings were downloaded and viewed in VLC Media Player which is a free playback application (Hughey & Maaks, 2020). The recordings were digitally stored on a secure NHS computer system. Transcripts of the complete consultations were typed.

The use of different methods of analysis to develop a comprehensive understanding of a phenomenon is referred to as triangulation (Patton, 1999). In this study, three different analysis methods were adopted; scoring the videos using the Calgary-Cambridge consultation model (Kurtz & Silverman, 1996); Thematic Analysis of the video transcripts (Braun and Clarke, 2012) and analysis of the videos using the Medical Interactive Process System (Ford et al., 2000). The use of more than one method added rigor, richness and depth to the study (Denzin 2012).

The Calgary-Cambridge model has five stages and two themes which run through the consultation (Denness, 2013) (Table 1).

Table 1 The Calgary-Cambridge Consultation Model Stages and Application

<b>The Stages</b>	<b>Application</b>
Initiating the Session	Establish a rapport and empathy, legitimise the patient's view Establish the reason for the consultation and set an agenda
Gathering Information	About current knowledge, ideas, concerns and expectations, where open and closed questions would be used, also picking up on cues
Physical Examination	
Explaining and Planning	Giving correct amount of information Facilitating patient recall and understanding by giving information in chunks and checking for understanding Planning using Shared Decision Making
Closing the Session	Include summarising and ensuring that there is an agreed and clear plan

The themes which run throughout the consultation are based on providing structure to the process and build on the relationship with the patient. The Calgary-Cambridge model meets the seven criteria described by Perry (2011) and has been adapted to be applied in the nursing context and was therefore selected as an appropriate model with which to assess the consultation techniques used by nurses in the video-recordings for the study.

### Analysis

The recordings were analysed using a framework derived from the Calgary-Cambridge model categories, except for physical examination, which would not be expected to be performed in these consultations. Each category was scored on a 4-point scale:

- 0 = no evidence
- 1 = needs development
- 2 = competent
- 3 = excellent

The timings of all the consultations were available from the recordings which were scrutinised for the amount of time the nurse and the patient were talking. Correlations between the Calgary-Cambridge scores and timings were calculated using Pearson correlations.

In addition to the CC model, the Medical Interactive Process System (MIPS) developed by Ford et al (2000) was also used to code interactions. The basic coding unit of the MIPS is the utterance where each one is coded separately. The MIPS also includes non-verbal categories such as head nodding, eye contact and touch. MIPS has previously been used to analyse the interaction style between physician led and nurse led clinics in Rheumatology (Vinall-Collier et al., 2016).

The exploratory method used to explore the data was thematic analysis as the aim of the analysis was to explore the data, identifying specific themes and ideas. A phenomenological approach to the thematic analysis focussed on the human experience and this methodology is commonly adopted in social sciences (Guest et al., 2012). All of the transcripts were thematically analysed allowing a systematic identification and organisation of patterns of themes across the dataset (Braun and Clarke, 2012). Two researchers (SMR, Rheumatology Nurse Researcher and DW Consultant Rheumatologist) analysed the transcripts separately and discussed any areas of disagreement until inter-coder agreement was reached. All of the transcripts were read multiple times until the whole experience was understood, then themes were generated. Significant statements relating to the themes were then highlighted to illustrate the themes.

## Results

To protect the identity of the nurse participants, minimal demographic data was recorded. The nurses were aged between 30-60 years of age. Nurses 1 and 2 (N1 and N2) had 2 years' experience working in Rheumatology, Nurse 3 (N3) had 5 years' experience in Rheumatology and Nurse 4 (N4) had 20 years' experience working in Rheumatology. None of the nurses had undertaken any formal training; they learned from each other and from Rheumatologist colleagues and they attended Rheumatology meetings whenever the opportunity arose. Patients were aged between 25 and 74 years old (mean = 51); 8 (80%) were female. Patient demographics are reported in Table 2.

Table 2 Patient Demographics

Patient	Age	Male/Female	Nurse Conducting Consultation
P1	62	Female	N1
P2	54	Female	N1
P3	25	Female	N2
P4	27	Female	N3
P5	46	Female	N4
P6	44	Male	N3
P7	72	Female	N1
P8	68	Male	N3
P9	42	Female	N4
P10	74	Female	N2

Analysis of the consultations according to the Calgary-Cambridge scoring system are shown in Table 3.

Table 3 Results of the Calgary-Cambridge Analysis

Category	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	Mean
Initiating	1	0	2	2	1	2	1	1	2	2	1.4
Agenda Setting	0	0	1	1	1	0	0	0	0	1	0.4
Information/knowledge	0	0	1	1	2	0	0	1	2	1	0.8
Idea/concerns/expectations	0	0	1	0	1	0	0	0	1	0	0.3
Chunking/checking	2	2	2	3	3	2	2	2	3	3	2.4
Written information	0	0	0	0	0	0	0	0	0	0	0
Closing Summary	3	2	2	2	2	2	3	2	2	2	2.2
Future Plan	1	1	1	0	2	1	0	1	0	1	0.8
Structure	2	2	3	2	2	2	2	2	3	2	2.2
Clarity	2	2	3	3	2	2	2	2	3	3	2.4
Rapport	2	2	3	2	3	3	2	3	3	2	2.5
Empathy	2	2	2	2	3	2	2	3	3	2	2.3
Patient Perspective	1	2	2	2	3	1	1	2	2	2	1.8
Picking up Cues	0	1	1	1	1	0	0	1	1	1	0.7
<b>Scores</b>	<b>15</b>	<b>16</b>	<b>22</b>	<b>19</b>	<b>25</b>	<b>15</b>	<b>14</b>	<b>19</b>	<b>23</b>	<b>20</b>	<b>18.8</b>

0= no evidence; 1= needs development; 2= competent; 3= excellent

#### Analysis against the Cambridge-Calgary Framework

The nurses were competent or excellent in: explaining; using written information; planning; structure; clarity and rapport, with mean scores across these categories ranging from 2.2 to



2.5. There was variability in: initiating the purpose of the consultation; exhibiting empathy (mean scores 1.4 to 1.8). In the following domains, the activity was either not observed or the nurse was felt to “need development” (mean scores 0 to 0.8); specifically setting the agenda; gathering information; checking for understanding; summarising or legitimising the patient perspective. The total time spent talking during the consultation varied from 12:20 to 23:40 (mean 17:34). The total number of seconds where the nurse or patient was talking are shown in Table 4. The nurse spent 69% to 86% of the total time talking, with the patient engaging in discourse for the rest (14 to 31%).

Table 4 Proportion of time spent talking during the consultation

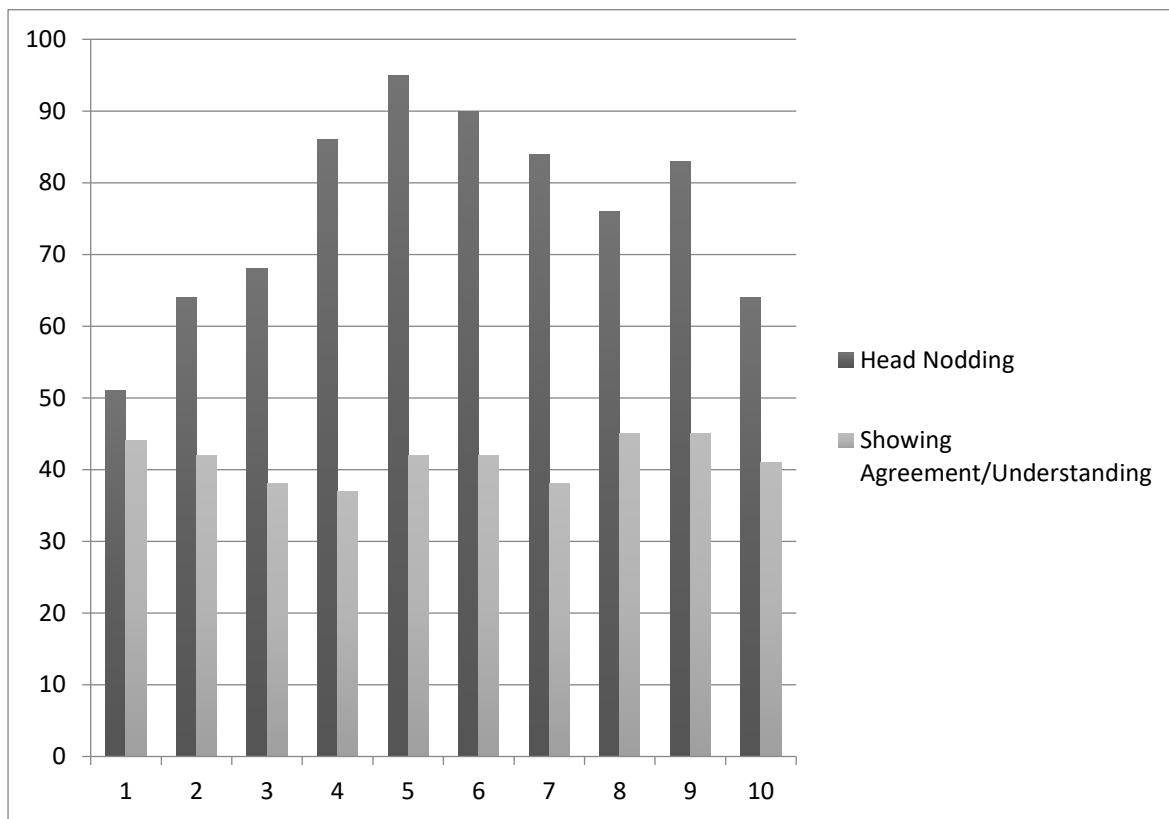
	Nurse Talking	Patient Talking
	Seconds (%)	Seconds (%)
Video 1	913 (75%)	310 (25%)
Video 2	515 (77%)	163 (23%)
Video 3	950 (80%)	237 (20%)
Video 4	705 (85%)	124 (15%)
Video 5	915 (70%)	399 (30%)
Video 6	654 (85%)	118 (15%)
Video 7	785 (79%)	213 (21%)
Video 8	655 (86%)	105 (14%)
Video 9	761 (69%)	341 (31%)
Video 10	1055 (74%)	365 (26%)

There was no significant correlation between the total of the Calgary-Cambridge score and the time the patient spent talking ( $r=0.5473$   $p=0.10$ ), and there was no significant correlation between proportion of the time that the nurse was talking with the Calgary-Cambridge score ( $r=0.4298$   $p=0.24$ ). There was a significant correlation between the proportion of time the patient spent talking and the length of the consultation ( $r=0.7055$   $p=0.02$ ). The total time the consultations took varied in length from 12:42 – 23:54 (mean 17:48) however, it is not clear whether the nurses’ perception of time to do the consultations, influenced the amount of time they spoke and limited the amount of time the patients had to ask questions.

#### MIPS Analysis

Using the MIPS analysis, the number of times the patient nodded per minute and the number of times the patients showed agreement or understanding, by responding “yes” or indicating by a positive “yeah” were plotted on a chart for all patients. The results are shown in Fig 1.

Fig 1 Total number of Head Nodding and Agreement per minute for all Patients



The thematic analysis of the videos and the transcripts generated three main themes:

1. The Nurse Agenda
2. Information Overload
3. Missed Cues

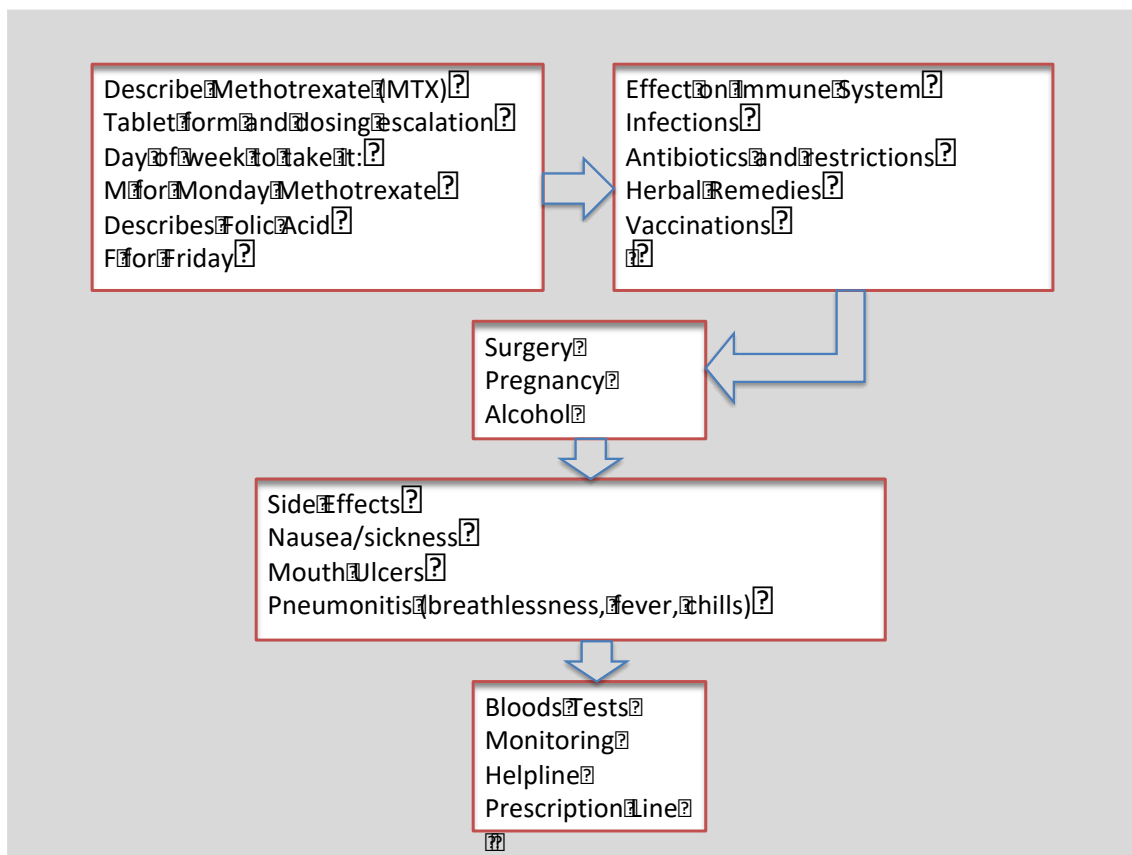
### Theme 1 The Nurse Agenda

All of the consultations were structured around the content of the methotrexate information booklet produced by Versus Arthritis (2019). This had the benefit of:

- structuring the encounter
- dictating the content
- providing written material

The typical flow of the consultation is represented in fig 2.

Fig 2 The Consultation Structure



The focus on delivering all the information in the leaflet dominated all consultations with examples of nurses cutting the patients short and taking the agenda back to the next item in the leaflet.

P9 *"...I'm just worried...in case it interacts between the drugs I take already".*

The patient gives the nurse a list of all of the medications the nurse comments:

N4 *"A nice little cocktail..."*

Once all of the drugs are recorded, the nurse goes on to say:

N4 *"right, brilliant, brilliant, okay so the Methotrexate is not a painkiller, it's a disease modifying drug..."*

Further cues emerge during the consultation:

N4 *"you can't have them...one is called Septrin..."*

P9 *"I'm allergic to it.."*

N4 *"...the other one is Trimethoprim..."*

P9 *"I'm allergic to it..."*

N4 *"Perfect, so you are never going to have that problem"*

Finally it emerges during the consultation:

P9 *"...they said that about the iron infusion I had as well, I had an anaphylactic shock with that...I nearly died..."*

This may be the reason why the patient was so anxious about drug reactions, and the nurse's response appears to demonstrate that, but this may have taken the nurse out of her sphere of knowledge and confidence, as she remarks:

N4 *"Well, I haven't heard of anybody yet having anaphylaxis...and I don't want to hear about it either".*

P9 *"No and I'd rather it not be me..."*

In another case the nurse agenda extended to almost demanding that the patient had an IM steroid when the patient clearly preferred the tablets:

N3 *"do the injections work [steroid injections]..."*

P4 *"I haven't had one.."*

N3 *"You haven't had one of those? Right.."*

P4 *"I didn't fancy one of them"*

N3 *"Okay, we could probably do that today...."*

P4 *"I'd really rather have the tablets..."*

The Nurse acknowledges this, but says

N3 *“Dr ---- is not actually here today so if I can’t get one [a prescription] it might be another option rather than you come off it [oral prednisolone] then go back on it ...Okay...have a think about it...”*

This exchange appears to have been driven by the difficulty the nurse would have to get a prescription signed for the oral Prednisolone.

### Theme 2: Information overload

During the consultations, the nurse typically made reference to the (large) volume of information that she had just provided to the patient:

N3 *“Okay, I’ve just kind of bombarded you there...so if you think of anything else feel free to give me a ring next week and we can explain anything with you...”*

N1 *“If I’ve spoken too fast and you are not too sure then ring...”*

P2 *“it’s a lot to take in...”*

N1 *“Oh there is a lot.....”*

Further educational opportunities through a help line were usually offered.

P5 *“...if I’ve got any problems I wont hesitate to give you a call...”*

N4 *“It’s what we are here for though...”*

### Theme 3 Missed Cues

The third theme to emerge from the data was missed cues from the patient. Opportunities for the nurse to explore patient cues were missed because the primary objective of the consultation was delivering all the information contained within the drug leaflet:

P1 *“I really want to get off this...I really do want to get off [oral prednisolone]”*

N1 *“In terms of your symptoms, how are you doing, have you had any visual disturbances and blurred vision”?*

P1 *“I have a cataract...”*

N1 *“Right, so, Methotrexate education...”*

P2 *“...I can’t yawn properly...you know when you yawn you open your whole mouth...I can’t do that anymore...”*

N1 *“Right, so I will give you the prescription and we will see you again in two weeks...but if there’s any issues ring the helpline”.*

And:

P8 *“I’m doing badly, I mean you do all the training and you don’t seem to get any fitter you know....because I was thinking about packing it all in...”*

N3 *“Well, lets see how this goes and you might just still be able to do it, alright, where did we get to...”?*

However, there were opportunities where the cues are recognised, the nurse is within her sphere of knowledge and experience and deals with cues well:

P9 *“Now with my knees and my joints are just...my fingers...even picking up a pen...”*

N4 *“Have you seen an Occupational Therapist”?*

P9 *“No, I haven’t”.*

N4 *“I can refer you there...”*

P8 *“I feel like my whole body is breaking down...”*

N3 *“Right, so we need to get you some semblance of normality...”*

### Discussion

Ten nurse consultations were analysed from three different perspectives: comparison with a standard consultation model, the Calgary-Cambridge model; thematic analysis of the transcripts and detailed examination of head nodding non-verbal behaviours (MIPS analysis). The results of the video analysis demonstrated that information transfer dominated the interaction. The patients were informed of the important facts and processes, given written information for further reading, and all had a clear invitation to telephone the nurse for

further support and clarification. However, it was clear that the patient agenda was not addressed and that cues for further discussion and education were being missed. There is evidence that consultations, which address the patient agenda, result in improved patient satisfaction (Carter & Berlin, 2003).

It is clear that the interaction between the nurse and patient in a Methotrexate education session is complex and no single method of analysis would be able to evaluate all of this complexity. Therefore, triangulation of the data was used to explore as much of the interaction as possible. The Calgary-Cambridge model is a proven model for consultations involving the transfer of knowledge. Whilst the model was developed to be used by the medical profession there is evidence that nurses using this model can improve their communication and interview skills with patients (Yuan et al., 2012).

Donnelly et al (2016) recognise that applying the Calgary-Cambridge model resulted in more meaningful, empathetic communication between the nurse and patient in the palliative care setting. McLeish and Snowdon (2017) applied the Calgary-Cambridge model to illustrate that prescribing decisions can be enhanced and provide direction to the consultation. Applying the Calgary-Cambridge model resulted in a more meaningful and empathetic consultation between the nurse and patient in the palliative care setting (Donnelly & Martin, 2016) and also enhanced decision relating to prescribing medications for patients (McLeish & Snowden, 2017). It is clear from our observations that some important aspects of the Calgary-Cambridge consultation model were not being applied and that applying them could result in a better consultation.

The consultation was based on the methotrexate information leaflet which may have led to missed opportunities to recognise cues from the patient. Whilst the study was not able to investigate the reasons for this, it could have been driven by perceived time pressures. The data on the time each participant spent talking suggests that the involvement of the patient, which resulted in higher scoring on the Calgary-Cambridge scale, added to the length of the overall consultation. It was clear that during each consultation, the type of information given was consistently similar, and took a similar amount of time to deliver; this would explain why the “extra” involvement of the patient did add some time. However, there is evidence that recognising and dealing with cues can save time by focussing the consultation on the important concerns for patients (Silverman et al., 2016). This may also save time at

subsequent visits. It is possible that education and training for nurses in consultation skills could result in more efficient consultations.

The nursing role has expanded over the years, and whilst undergraduate nurse training continues to evolve, it may not be aligned with these emerging roles as the importance of consultation skills does not appear to be a priority in the latest NMC guidelines for nurse training (Nursing and Midwifery Nursing and Midwifery Council, 2018). Over the last 20 years many specialties, especially those treating patients with chronic disease, have become almost exclusively out-patient based, which has meant that the nurses are now conducting outpatient clinics where communication and consultation skills are essential. Exactly how consultation training should be taught to nurses will merit further study, but Deighan (2011) suggests that consultation teaching is not just about behaviour but also includes attitudes, values and beliefs.

The results of the MIPS analysis show a high degree of head nodding compared to displaying agreement and understanding by the patient. There were numerically almost twice as many head nods as positive utterances indicating that head nodding alone may not indicate understanding. It is generally considered that head nodding represents showing agreement and understanding (Petukhova & Bunt, 2009; Thepsonthorn et al., 2016). However, Helweg-Larsen et al (2004), in a study of students in a classroom situation made observations which led them to suggest that head nodding reflected a perceived dominance of the teacher over the students. The high level of head nodding behaviour by patients in these situations where the nurse could be viewed as the knowledge holder and the patient as the knowledge receiver could represent a similar situation where the nurse holds a higher status as the knowledge holder. What could be of particular importance is the nurse's view of this. The nurse may regard this nodding behaviour as confirmation of understanding, which allows them to continue their agenda regarding information giving, without feeling the need to stop to check understanding and may have accounted for some missed cues. Further studies utilising video recordings of nursing consultations could examine this in further depth by using recordings as an interview aid to prompt reflections.

### Conclusions

Video-recording has developed into a powerful tool for research in the social sciences (Janík et al., 2009). It allows the study of complex processes; increases inter-rater reliability and



coding from different perspectives can be undertaken (Hiebert et al., 1999). The use of a video camera could also be viewed as less intrusive than a physical presence by the researcher. The video-recording allows the whole interaction between nurse and patient to be captured in order to investigate effectiveness of the consultation.

The nurses were good at structuring the consultation, establishing rapport, giving information and instructions, all of which are central nursing skills. The content, flow and chunking of the consultation was consistent, driven by the use of the patient information sheet. The nurses missed opportunities to explore patients' expectations, concerns or needs throughout the consultations. The overarching aim of the consultation was to deliver information, using the Methotrexate information leaflet as a guide. The nurses speaking for between 69% and 86% of the time supports this.

Nurses were variable at assessing pre-knowledge and overlooked openings to evaluate the patient's understanding of information during the consultation. Patient feelings about the drug were sometimes offered by the patient but not often explored by the nurses. Some patient cues were missed. A lot of the patient head nodding may not have reflected understanding (Helweg-Larsen et al., 2004) but it may have encouraged the nurses to perceive this as understanding, which resulted in missed cues.

Whilst limited to 10 video-recordings from 1 rheumatology service, the findings add weight to the need for rheumatology nurses to receive education in effective consultation skills.

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