

# Registered Nurse Prescribing Referral

A Preliminary Literature Review on the Effectiveness of Registered Nurse Prescribing

December 2015

Please note that this Preliminary Literature Review is a summary of information from other sources, not a representation of the policy position or goals of the Ministry of Health and Long-Term Care. If material in the review is to be referenced, please cite the original, primary source, rather than the review itself.

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### SUMMARY OF MAIN FINDINGS

- Very little information was identified which explicitly examined RN prescribing; most literature identified examined 'nurse' prescribing in general or considered nurses within the broader category of 'non-medical prescribers'.
- The quality of research literature on nurse prescribing is low. Further, little information was identified regarding the impact of nurse prescribing on patient outcomes.

### Impact of Nurse Prescribing

- Limited research was identified that examined the impact of nurse prescribing on patient outcomes; some low quality evidence suggests that there may be few differences in patients' clinical outcomes (perceived or actual) when comparing nurse prescribing to physician prescribing.
- Nurses prescribe in comparable ways to physicians; they prescribe for equal proportions of patients and prescribe comparable types and doses of medicines.
- Nurse prescribing has been implemented in various clinical areas such as diabetes management, palliative care, treatment of skin conditions, and respiratory care.
- The evidence surrounding efficiency of nurse prescribing is weak; however, one UK study suggests that nurse prescribers spent more time with patients, at a substantially lower cost per episode, than physicians.
- Care provided by nurse prescribers is generally observed to be safe (e.g., in terms of clinical appropriateness of prescribing) and of good quality (e.g., similar to or better than that provided by physicians).
  - Two studies were identified which examined the appropriateness of prescriptions written by nurse prescribers and suggest that in general, medications prescribed were appropriate (e.g., based on clinical condition, correct medication prescribed, dosage correct); however, these studies also suggest that there are areas for improvement (e.g., acceptable duration of therapy).
  - It was noted that nurses tend to give patients a range of information about their medications, including advice on self-medication and self-management, and to check their understanding and commitment to the treatment; however there was room for improvement in instructions regarding side effects and risks of treatment options.

### Perceptions of Nurse Prescribing

- The research literature appears to focus primarily on the perspectives of nurse prescribers:
  - Prescribing is seen by some nurses as a key component of core nursing practice and can contribute to job satisfaction, in relation to autonomy and ability to provide patient-centred care.
  - Many nurses feel confident about prescribing; however, some nurses also noted that they feel some anxiety related to their responsibilities and knowledge base for prescribing.
- There were mixed findings about physicians' perceptions of nurse prescribing; however, some positive perceptions were observed among physicians with greater exposure to and familiarity with nurse prescribing.
- The literature reports generally favourable attitudes among patients and the public regarding nurse prescribing; in some cases, nurse prescribing was seen by patients as having advantages over physician prescribing, such as ongoing care relationships, satisfaction with care (e.g., more holistic care), and accessibility of services.

### OBJECTIVES

The requestor's stated objective was to examine the effectiveness of Registered Nurse (RN)<sup>a</sup> prescribing. Particular topics of interest included information on the impact of RN prescribing on outcomes such as:

- Access to care (e.g., as related to wait times, access to health care or medicines);
- Patient safety (e.g., adverse events or hospitalization, adverse clinical outcomes);
- Patient satisfaction;
- Perceptions of RN prescribing by health professionals, patients, and members of the public; and
- Economic Impacts.

The literature review: [A Preliminary Literature Review on Registered Nurse Prescribing](#), provides an overview of RN prescribing in other jurisdictions (i.e., Australia, Ireland, New Zealand, Sweden, the United Kingdom [UK] and the United States [US]) including information on models used in these jurisdictions, supports put in place to enable nurse prescribing (e.g., legislation, regulation, education and training), as well as some limited research evaluating the RN prescribing models.

### SEARCH METHODS

Individual peer-reviewed articles and review articles were identified through the Ontario Ministry of Health and Long-Term Care's computerized library database, Ontario Government Library Council databases, PubMed, and Google Scholar. Grey literature was identified through Google, relevant government websites, and the Policy Intelligence Repository which is available on the Ontario Ministry of Health and Long-Term Care's [Directory of Networks \(DoN\)](#). The search was limited to English sources and therefore may not capture the full extent of initiatives in non-English speaking countries. In order to ensure greatest relevance and maximize efficiency, search/review was focused between the publication years 2004 to present.

The Medical Subject Heading (MeSH) terms "Nurse" and "Inappropriate Prescribing" were used in combination with the following keywords to identify relevant articles and documents for this review: "nursing/nurse", "prescribing", "effectiveness" and "evaluation".

A total of 20 references were identified and cited in this review: seven review articles, nine papers from peer-reviewed journals, and four documents from the grey literature. In total, the searching for relevant material and writing of this review took approximately eight days to complete by one person.

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<sup>a</sup> In Ontario, registered nurses (RNs) undertake a comprehensive education (i.e., four year bachelor's degree) and autonomously meet the nursing needs of clients, regardless of the complexity of their conditions ([Health Force Ontario, 2013](#)).

## DESCRIPTION OF THE FINDINGS

### 1. Background and Terminology

Bhanbro et al. (2011) noted that the key policy goals of extending prescribing authority to other health professionals, such as nurses, have been to improve patient access in primary care settings to safe, timely, and effective medicines and increasing the efficiency of health service delivery. Accordingly, nurse prescribing has been common practice in some jurisdictions for decades (e.g., the UK has increasingly permitted nurses to prescribe, starting with a limited formulary in the 1990s, and expanding this authority over time).<sup>1</sup>

In general, there are three types of nurse prescribing models which are used in other jurisdictions. For the purpose of this review, these include:

- **Independent Prescribing** – In this model a nurse may prescribe medications, from a limited or pre-defined formulary, within a regulated scope of practice. Independent prescribing is used in Ireland, New Zealand, the UK,<sup>b</sup> and the US.
- **Supplementary Prescribing** – This model involves a patient-specific partnership (known in the UK as a ‘clinical management plan’) between a physician and RN, where after initial diagnosis by the physician and with the patient’s agreement, a nurse may prescribe medication from a limited formulary. Supplementary Prescribing is used in the UK and some US states (i.e., Delaware, Iowa, Indiana, and Missouri).
- **Use of Protocols (also known as ‘Patient Group Directions’ in the UK)** – In this model, multi-disciplinary teams develop written instructions which allow RNs to supply and administer medications within the terms of the predetermined protocol. These are used in Australia and in the UK.

For further details on each of these models and their use in other jurisdictions, see Planning Unit Product #386 [A Preliminary Literature Review on Registered Nurse Prescribing](#).

The focus of this literature review will be primarily on the independent and supplementary forms of prescribing, as these are most frequently discussed in the evaluation literature.

### 2. Limitations

Little research literature was found that explicitly examined the effectiveness of RN prescribing. Instead, most of the research literature identified examined ‘nurse prescribing’ in general or in some cases, considered nurse prescribing within the context of ‘non-medical prescribers’ (NMPs).<sup>c</sup> For the purpose of this review, information on ‘nurse prescribing’ was included; however, the findings presented here should be interpreted with caution. For example:

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<sup>b</sup> As of 2012, there were 19,000 nurse independent prescribers and 1,500 pharmacist independent prescribers in the UK in primary care, hospitals, community clinics, urgent care services, and patients’ homes (Latter, 2012).

<sup>c</sup> The term NMP is used in UK-based literature to refer to authorization for non-physician health professionals to prescribe medication. Primarily, these non-physician health professionals are nurses and pharmacists, but may also include others, such as radiographers ([National Health Service - Hillingdon Hospitals, 2012](#)).

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- The literature on 'nurse prescribing' was not always clear on the level of nurse being described (e.g., nurse practitioner,<sup>d</sup> registered practical nurse,<sup>e</sup> or RN).
- In general, the literature examining NMPs does not always analyze data for nurse prescribers separate from data for other non-medical health professionals (e.g., pharmacists).

Accordingly, for the purpose of this review:

- Information and examples on prescribing by nurse practitioners were excluded.
- Among literature which described NMPs, only sources in which nurses formed the majority of the sample were included.
- Some literature was unclear regarding the classification of nurses studied, the proportion of the sample made up of nurses (i.e., in NMPs research), or whether conclusions drawn were specific to nurses (e.g., nurses and pharmacists in NMPs research). Some of these research studies have been included in this review, however, these limitations are highlighted below, when describing these studies.

Other limitations observed within the literature identified included:

- Very little information is available regarding the impact of nurse prescribing on patient outcomes. For example:
  - A 2011 systematic review on prescribing in primary care by nurses and professionals allied to medicine, suggests that there is very limited evidence available on NMP outcomes (e.g., patient safety and clinical outcomes).<sup>2</sup>
  - Similarly, a 2014 systematic review on the effects of nurse prescribing notes that while several reviews have been conducted on the legal and/or educational conditions under which nurse prescribing has been implemented in different countries, and other non-systematic reviews have investigated the advantages of nurse prescribing with respect to access and delivery of care and nurses' knowledge and skills, few reviews have examined topics such as the effects of nurse prescribing on medication outcomes (i.e., indicators of safe, quality prescribing) and patient outcomes.<sup>3</sup>
- In general, the quality of research literature on nurse prescribing is low. For example:
  - A 2014 systematic review on nurse prescribing concluded that, due to methodological weaknesses in this body of research (e.g., heavy reliance on self-reported data), conclusions must remain tentative. In particular the authors suggested that more randomized controlled designs in the field of nurse prescribing are required to enable definitive conclusions about the effects of nurse prescribing. The authors also note that while previous reviews have found that nurse prescribing was evaluated positively, these reviews all lacked a comparative design that outline differences between nurse and physician prescribing.<sup>4</sup>

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<sup>d</sup> In Ontario, nurse practitioners are usually RNs who have taken on an advanced role after having additional education and experience. Nurse practitioners are able to autonomously diagnose, order, and interpret diagnostic tests, prescribe pharmaceuticals, and perform procedures within their legislated scope of practice ([Health Force Ontario, 2013](#)).

<sup>e</sup> In Ontario, registered practical nurses study for a shorter period of time (i.e., two or three year diploma) and work with clients with less complex conditions ([Health Force Ontario, 2013](#)).

- The majority of the literature identified focused on evaluation of nurse prescribing and related stakeholder experiences in the UK; a smaller proportion looked at nurse prescribing in other countries, including Ireland, Canada, United States and Australia.
- No information was identified on the economic impacts of nurse prescribing, aside from findings related to efficiency and cost considerations.

### 3. Impact of Nurse Prescribing

In terms of overall impact of nurse prescribing, three key themes were identified in the literature and are summarized in the sections below: 1) Clinical Outcomes and Effectiveness of Nurse Prescribing; 2) Efficiency and Cost Considerations; and 3) Safety and Quality.

#### 3.1. Clinical Outcomes and Effectiveness of Nurse Prescribing

As discussed in [Section 1 \(Limitations\)](#) above, researchers have noted that high quality research related to the impact of nurse prescribing on patient outcomes is quite limited. The information in this section will look at patient clinical outcomes identified in the literature.

A 2014 systematic review of 35 studies examined the effects of nurse prescribing compared to prescribing by physicians.<sup>f</sup> Among the studies reviewed by the authors, 22 involved independent nurse prescribing, two involved supplementary nurse prescribing, five examined a mix of the two types of prescribing, while six described prescribing based on 'group directions'. Within their discussion of results, however, the authors did not attribute results to the specific models of nurse prescribing, which included prescribing by nurses and nurse practitioners. According to the authors, there appear to be few differences between nurse and physician prescribing on patient health outcomes:

- Eight of the 13 studies reporting on clinical outcomes found no differences between nurse prescribing and physician prescribing.<sup>9</sup>
  - Examples of clinical outcomes that were similar included: diabetic control (i.e., blood sugar control), blood pressure, asthma control, and patients' rating of their health status or improvement after two weeks.
- However, some studies reported mixed findings with regard to the clinical outcomes of patients receiving prescriptions from nurses or physicians. For example:
  - **Sore throat:** A UK study found that patients' perceptions of being back to normal health and the median number of days for sore throats to settle were more favourable for patients receiving prescriptions from nurses compared to general practitioners (GPs).<sup>5</sup>
  - **Diabetes and hypertension:** A Canadian study found that patients with diabetes and hypertension receiving prescriptions from nurses had a larger drop in diastolic blood pressure than patients receiving prescriptions from physicians.<sup>6</sup>
  - **Diabetes:** Three Dutch studies showed mixed findings related to cholesterol control for patients with diabetes.<sup>h</sup> In particular, one study found no difference

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<sup>f</sup> The authors of this systematic review do not specify the category of nurse examined within the individual studies included in their review. In examining the reference list for the systematic review, it appears that at least 14 studies cited are specific to nurse practitioners. No other information was provided.

<sup>9</sup> It should be noted that based on an examination of the reference list, four of the eight studies that drew this conclusion were investigating prescribing by nurse practitioners. No further details were provided.

between nurse and physician prescribing in patient's cholesterol/HDL ratio, one study found that the cholesterol/HDL ratio improved more for patients being treated by medical specialists, whereas another study found that cholesterol/HDL ratio improved for patients treated by a nurse specialized in diabetes.<sup>7</sup>

A number of individual studies have also identified clinical areas in which nurse prescribing has been successfully implemented. For example:

- **Palliative care:** Creedon and O'Regan (2010) identify a number of benefits of nurse prescribing in palliative care settings, including facilitating access to pain medication in a timelier manner combined with overall nursing assessment skills, responsiveness, and interdisciplinary teamwork.<sup>8</sup> No further information was provided.<sup>i</sup>
- **Treatment of skin conditions:** Carey et al. (2013), through a survey of 186 nurses, identified that nurse prescribers' involvement in medication management activities has important implications in terms of improving access to services (with nurses providing services in a number of primary care settings), efficiency (e.g., better use of time for physicians as nurses provide a wider range of care), and system cost-savings (e.g., given the large number of people who seek medical care for skin-related conditions). No further details were provided.
  - According to the authors, to maximize nurse prescribers' contribution to dermatological care, improved provision of specialist dermatology training is required; this will support nurses practicing to their full scope of practice. The authors note that nearly a quarter of participants in the study sample had never undertaken any specialist dermatology training.<sup>9</sup>
- **Respiratory care:** Carey et al. (2014) identified that prescribing enabled nurses to overcome existing problems in service provision to improve access, efficiency, and patient convenience, reducing hospital admissions and length of stay.<sup>j</sup> Prescribing by nurses in respiratory care was thought (by 40 nurses interviewed) to encourage self-management, improve patients' adherence to their medication regime, and help manage expectations to reduce inappropriate service use, through more patient centred care.<sup>10</sup>
- **Mental health care:** Norman et al. (2010) identified that there were no significant differences between patients in the nurse supplementary prescribers' group and the independent prescribers' (consultant psychiatrists) group in terms of medication adherence, health status, side effects, and satisfaction with overall care.<sup>11</sup>

### 3.2. Efficiency and Cost Considerations

The literature identified in this review considered the efficiency of nurse prescribing in terms of appropriate use of human resources, time, and costs. For example:

- **Prescription Costs:** A 2012 study conducted by Latter et al. concluded that prescribing decisions by nurses would benefit from due consideration of drug cost; this is based on the finding that 16% of prescribing decisions were deemed 'inappropriate' in this regard (i.e., prescribers did not consider prescribing less expensive alternatives of equal utility).<sup>12</sup>

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<sup>h</sup> As measured by cholesterol/high density lipoprotein (HDL) ratio. This is the ratio between HDL (also known as 'good cholesterol') and total cholesterol (including low density lipoprotein [LDL] or 'bad cholesterol'). This ratio may be used to help identify heart disease risk ([Mayo Clinic, 2012](#)).

<sup>i</sup> Quantitative findings were not provided in this article.

<sup>j</sup> No further information was provided to quantify these findings.

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- However, another study cited by Latter and Courtenay (2004) suggests that some nurses do prescribe less expensive products where therapeutic value of the drug was comparable.<sup>13</sup>
- **Length of Consultation Time:** A 2008 evaluation of supplementary prescribing by nurses and pharmacists in the UK suggest while that supplementary prescribing is cost-effective, in the case of nurses it is also twice as time-consuming per patient as physician consultations,<sup>k</sup> which according to the authors may have an impact upon overall patient waiting lists.
  - However, the authors also note that nurses used consultations as opportunities to undertake examinations, conduct health checks, measure blood pressure, take blood samples and conduct medicine use reviews, making direct comparisons with physicians difficult.
  - Further, the authors state that cost and time estimates for nurse and physician prescribing are difficult to compare, since the costs reported in this research consider all areas of supplementary care provided by nurses, whereas the cost measurements of physician prescribing consider primary care only.<sup>14</sup>
- **Service Delivery Improvements:** According to Jones et al. (2010), prescribing by hospital-based nurses was found to benefit patients in acute care settings through service delivery improvement (i.e., making better use of physician time) and enabling nurses to make better use of their full scope of practice. The case study looked at a hospital in England in which nine nurses had undertaken preparation for prescribing, of whom seven were actively prescribing.
  - No differences were found in how nurses and doctors performed prescribing roles, but there was a statistically significant difference in patient satisfaction with how nurses provided medication-related information (66% of patients who had consulted a nurse were satisfied with the information provided) compared to doctors (7% of patients were satisfied with the information provided).<sup>15,l</sup>

### 3.3. Safety and quality

According to Gielen et al. (2014), safety and quality is identified as a concern for policy makers in the literature, with respect to implementation of nurse prescribing and related care. They also suggest that further research is necessary to directly compare nurse prescribing with that of physicians.<sup>16</sup> Among literature identified on the safety and quality of nurse prescribing, some information was found that compared nurse and physician prescribing practices (e.g., total medication prescribed, number of patients prescribed to, provision of information) and the appropriateness of prescriptions.

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<sup>k</sup> Bissell et al. (2008) identified that the supplementary prescribing consultations cost £6.50 (or CAD \$13.91) for nurses and took an average of 21 minutes, whereas physician consultations last 12 minutes and cost £34 (or CAD \$72.76) (In 2007, UK £1 = CAD \$2.14; [Bank of Canada, 2007](#)).

<sup>l</sup> A total of 64 patients were given a standardized satisfaction survey; of these, 50 had seen a nurse and 14 had seen a doctor.

In particular, a 2014 systematic review by Gielen et al. notes that prescribing patterns reported in the literature vary widely.<sup>m</sup> For example,

- **Number of Patients Receiving Prescriptions:** Eleven<sup>n</sup> out of 15<sup>o</sup> studies found that the percentage of patients for whom a nurse prescribes medication is similar to that for physicians. Additionally, one study found that nurses prescribed to a lower percentage of their patients, two<sup>p</sup> studies found that nurses prescribed to a higher percentage compared to physicians, whereas two<sup>q</sup> studies had unclear findings (related to unreported significance levels).
  - Based on these findings, the authors concluded that nurse prescribing is of similar quality to physician prescribing, and worries about whether nurses have the competence to prescribe appear to be unfounded.<sup>17</sup>
- **Provision of Information to Patients:** All five studies<sup>r</sup> reporting on provision of information to patients, found that nurses gave more or the same amount of information to patients as doctors. For example,
  - In one study, nurses were found to give more advice about home remedies for sore throats than GPs. In another study nurses were found to give more advice on self-medication and general self-management compared to physicians. In a third study, significantly more nurses than physicians said that they informed patients about contraceptive security and the risk of arterial thromboembolic disease,<sup>s</sup> and offered follow-up when prescribing oral contraceptives for the first time.<sup>18</sup>

Additionally, the author of a 2008 literature review on the safety and quality of independent prescribing (Latter, 2008) states that a shared decision-making (or patient-centred) approach (i.e., between nurses and patients) is likely the most effective route in reviewing and discussing beliefs about medication. The author suggests that this will ensure that the patient understands and agrees with the treatment plan. In drawing this conclusion, Latter pulls from her earlier findings in a 2005 observational study by her and her colleagues, which examined nurse prescribers' practice,

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<sup>m</sup> The authors of this systematic review do not specify the category of nurse examined within the individual studies included in their review. In examining the reference list for the systematic review, it appears that at least 14 studies cited are specific to nurse practitioners. No other information was provided.

<sup>n</sup> It should be noted that based on an examination of the reference list, five of these 11 studies cited investigated prescribing by nurse practitioners. No further details were provided.

<sup>o</sup> It should be noted that based on an examination of the reference list, six of these 15 studies cited investigated prescribing by nurse practitioners. No further details were provided.

<sup>p</sup> It should be noted that based on an examination of the reference list, one of these two studies investigated prescribing by nurse practitioners. No further details were provided.

<sup>q</sup> It should be noted that based on an examination of the reference list, one of these two studies investigated prescribing by nurse practitioners. No further details were provided.

<sup>r</sup> It should be noted that based on an examination of the reference list, out of the five studies investigated, two looked exclusively at nurse practitioners. No further details were provided.

<sup>s</sup> Arterial thromboembolic disease is blockage of arteries; it is known to be a risk for women taking certain oral contraceptive medications. ([Science Daily, 2012](#)).

to describe and evaluate the competencies that nurses were using during patient consultations.<sup>†</sup> This 2005 study of 118 nurses found that:

- Nurses regularly gave patients a range of information about medication when prescribing (e.g., providing clear instructions for medication regarding dose, use, duration) (89% of interactions observed);<sup>‡</sup>
- Nurses regularly checked the patient's understanding and commitment to the treatment (73% of interactions observed);
- However, there was room for improvement in areas such as giving clear instructions regarding side effects and what actions to take (48% of interactions observed) and providing information about risks and benefits of treatment options (39% of interactions observed).<sup>19</sup>

### 3.3.1. Appropriateness of Nurse Prescribing

Two studies examined the appropriateness of nurse prescribing:

- Latter and colleagues' 2005 study found (based on a sub-sample of 10% or 12 observed consultations) that the majority of independent nurse prescribing consultations that were observed and assessed by a panel of seven medical prescribing experts using a standardized rating tool (i.e., a modified version of the Medication Appropriateness Index)<sup>‡</sup> were determined to be clinically appropriate based on a range of indicators, including: correct dosage (87% of consultations assessed); effectiveness of medication prescribed (83% of consultations assessed); and no apparent unnecessary duplication with other medications (96% of consultations assessed). However, some indicators were less consistently applied by nurse prescribers, such as:
  - Medication directions: 18% of consultations that were observed provided an incorrect direction and 12% of consultations that were observed provided directions that were not practical;
  - Acceptable duration of therapy: 12% of prescriptions were assessed as being for a duration that was not acceptable; and
  - Clinically significant interactions with other medications: 10% of prescriptions were assessed as having a clinically significant interaction with other medications a patient is taking.<sup>20</sup>
- In a 2013 Irish study<sup>w</sup> two reviewers examined RN prescribing practices and determined that 96-99% of medicines prescribed by nurses and midwives were indicated and effective for the diagnosed condition. Both reviewers also reported that for 90% or greater of the drugs prescribed: dosage was correct, directions were correct, prescribing was appropriate

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<sup>†</sup> A 2005 study by Latter et al., analyzed nurse prescribers' consultations with patients at 10 sites in England and evaluated independent extended nurse prescribing from the range of medicines available from the extended formulary at the time of the study (2003–2005) (Latter, 2008).

<sup>‡</sup> The authors observed 118 nurse prescribers' consultations over the 10 sites, and recorded them using a standardized observation tool.

<sup>‡</sup> The Medication Appropriateness Index (MAI) introduced by Hanlon et al. (1992) has been found to be a reliable, valid, standardized instrument for assessing multiple elements of drug therapy prescribing applicable to a variety of medications, clinical conditions, and settings (Hanlon et al., 1992 as cited in Castelino et al., 2010; Bregnhøj et al., 2005 as cited in Castelino et al., 2010).

<sup>w</sup> In this study, the sample included 142 patients' records and 208 medications prescribed by 25 RN prescribers; two expert reviewers applied the modified Medication Appropriateness Index (eight criteria) to each drug prescribed (Naughton et al., 2013).

based on clinically significant medication or clinical condition interactions, as well as unnecessary duplication of medication. The only criterion rated under 90% by one of the reviewers was acceptable duration of therapy.<sup>x</sup>

- The authors caution, however, that there is an identified risk of inappropriate prescribing and potential medication errors, particularly in high-risk groups such as older adults, breastfeeding mothers, and people with complex medical conditions, not unlike the risk for physicians.
- The authors suggest that patient safety relies on the prescribing practitioner being aware of the potential risks, undertaking careful patient assessment and documentation, and initiating increased patient monitoring and education. Furthermore, they state that there is a need for ongoing education and evaluation of prescribing practice to minimize the risk of potential drug errors.<sup>21</sup>
- No further details were provided.

#### 4. Perceptions of Nurse Prescribing

Some literature was identified that examined the perceptions of patients and health professionals (e.g., nurses) in relation to nurse prescribing. According to the authors of a 2011 systematic review, the acceptability of nurse prescribing considers questions of suitability and satisfaction from the perspective of both those receiving the intervention (i.e., the patients) and others providing or commissioning the service (i.e. other health professionals and managers); it therefore relates to perceptions of outcomes.<sup>22</sup> In particular, the research literature appears to focus primarily on the perspectives of nurse prescribers. For example, Creedon and Regan (2009) noted that the literature on perceptions of nurse prescribing tends to be heavily based on 'self-perception' and less so on the perceptions of other stakeholders. Furthermore, they note that the views of nurse prescribers themselves are over-represented in the research literature, compared to the opinions of physicians or other health professionals.<sup>23</sup>

##### 4.1. Nurses' Perceptions of Prescribing

In the literature, nurses identify some concerns regarding their own preparedness for prescribing and also have mixed opinions related to confidence in their role. Some research also suggests that they do believe their ability to prescribe brings benefits to their patients, such as time savings and convenience, as well as enhanced job satisfaction and feelings of autonomy for themselves.

##### 4.1.1. Perceived Benefits of Nurse Prescribing

A 2004 literature review by Latter and Courtenay examined the effectiveness of nurse prescribing and reviewed some literature on nurses' evaluation of their prescribing role. The authors suggest that nurses who prescribe are generally positive and satisfied with their role, although some concerns are highlighted by nurse prescribers related to the adequacy of their pharmacological knowledge. For example, among the studies included in the 2004 literature review:

- A 1997 study of 49 nurses reported that nurses identified time savings and convenience (i.e., patients not having to see a GP to arrange a prescription) as benefits of nurses' prescribing role. Nurses also reported an increased sense of satisfaction, status and autonomy, and believed that patients received better information about prescriptions from

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<sup>x</sup> Reviewer concordance was 87% or greater for all but one of the MAI criteria (duration of therapy acceptable was 76% concordance) (Naughton et al., 2013).

- a nurse; however, there were also disadvantages identified by nurses, including initial anxiety about writing prescriptions (i.e., associated with completing the prescription correctly), assuming responsibility previously taken by the GP, and fear of an incorrect diagnosis.<sup>24</sup>
- Twin studies (Otway 2001; Otway 2002) of 241 nurse prescribers in the National Health Service, found that the majority of prescribers considered prescribing to be a skill which is an essential part of core practice. The author noted that generally, nurse prescribers tended to describe prescribing in a very positive way; however some negative comments were also noted and related to nurses' frustrations associated with the limitations of the Nurse Prescribers' Formulary,<sup>y</sup> a concern shared by patients. However, the author of these studies also notes that nurses' expressed concern over the adequacy of their knowledge base in pharmacology, together with a need for further training in pharmacology<sup>25, 26</sup>
  - A 2001 study that surveyed 73 mental health nurses noted a number of potential improvements to care that were anticipated from nurse prescribing, including better client access to medication, improved compliance, prevention of relapse, and cost effectiveness.<sup>27</sup>

Additionally, a 2009 literature review of nurse prescribing also identified some research that reported on nurses' perceived benefits of nurse prescribing. The authors identified four studies that reported nurse perceived advantages for patients including convenience, time saving, enhanced patient care, improvement in compliance with medications, and prevention of relapses. Benefits to nurses themselves were also identified by the authors, including improved collaboration between medical and nursing professionals, as well as increased autonomy, role satisfaction, clinical competence, and career progression.<sup>28</sup>

#### 4.1.2. Perceived Confidence of Nurse Prescribers

Two literature reviews were identified that described nurse's perceived confidence related to prescribing; however findings were mixed:

- A 2009 discussion paper by Creedon and Regan described findings from seven studies related to nurse prescribers' confidence in prescribing, all of which identified that the majority of respondents felt confident in their prescribing. The authors also noted that continuing professional development and specialist training were reported to increase confidence.<sup>29</sup>
- Conversely, a 2008 review by Latter noted that, as a whole, the research suggests that nurses do not feel universally confident about their prescribing competence, but the reasons for this are not clear.<sup>30</sup>

A 2008 literature review by Cooper et al. described research related to perspectives about nurse or pharmacist supplementary prescribers in the UK. In all, the review looked at 14 studies related specifically to nurse (mostly supplementary) prescribers from the perspectives of a variety of stakeholder groups. In the 14 studies reviewed by the authors, limited information was provided

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<sup>y</sup> Since the first pilot sites were established in the UK in 1994, district nurses and health visitors have been trained to prescribe from a limited formulary of products called the Nurse Prescribers' Formulary (Latter and Courtenay, 2004). In 2006, nurse prescribers were given full access to the British National Formulary, which has put nurses on par with doctors in relation to prescribing activities (RCN, 2012).

specific to the nurses' own perspectives of their prescribing practice; only one study was cited that considered nurses' confidence:

- In one 2006 study, most nurses who were trained in primary care 'independent extended and supplementary prescribing'<sup>z</sup> (IESP) reported that they were confident in their prescribing, but only a minority actually practiced supplementary prescribing.<sup>31</sup> No further details were provided.

### 4.1.3. Nurse Prescribing: Job Satisfaction, and Autonomy

A 2007 study by Bradley and Nolan on the impact of nurse prescribing in the UK reports that, based on the results of interviews with 45 nurse prescribers, prescribing has the potential to increase job satisfaction and autonomous working for nurses, with the result that they are more likely to involve patients in decision-making about their care. The authors suggest that prescribing has the potential to improve service-user care, enhance collaboration, and widen discussions about medication; however, the authors suggest that team members need to be prepared for the impact nurse prescribing could have on the dynamics of the multidisciplinary team.<sup>32</sup>

## 4.2. Health Professionals' Perceptions of Nurse Prescribing

In the literature identified, mixed reactions were found among health professionals, in particular physicians, with regard to awareness of nurse prescribing, the safety of nurse prescribing, and concerns over erosion of traditional roles. According to several studies, the mixed perspectives were sometimes attributed to the level of experience and comfort in working with nurse prescribers.<sup>33,34, 35</sup> In particular:

- A 2008 literature review by Cooper et al. noted that, in contrast to nurses' (and other supplementary prescribers) positive responses to supplementary prescribing, the views of other healthcare professionals (doctors in particular) revealed a more reserved opinion. An over-riding theme and concern that emerged in many studies was that doctors appeared to be generally unaware of supplementary prescribing and although broadly positive about supplementary prescribing, they had a number of reservations relating to nurse prescribing (e.g., the erosion of doctors' traditional roles, erosion of professional hierarchies, and patient safety). For example:
  - Commenting on nurse prescribing generally, one study reported that medical mentors generally held positive attitudes towards nurse prescribing and supervision of nurse prescribers, but that these individuals already had a positive working relationship with nurses prior to training. Doctors' experience of clinical management plans varied, and limited time for mentoring and a lack of remuneration were identified as problems.
  - Another study explored attitudes to nurse supplementary prescribers amongst various clinical team members<sup>aa</sup> and reported that although there was overall support for nurse supplementary prescribing, there was a perception that supplementary prescribing simply formalized existing practices, that it might have

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<sup>z</sup> To qualify as a nurse prescriber (either Independent Prescriber or Supplementary Prescriber), nurses must undertake a recognised Nursing and Midwifery Council (NMC) accredited prescribing course through a UK university; these single, post-graduate programs are referred to as IESP. Upon successful completion, the qualification must be registered with the NMC. Since 2004, all nurses who complete the NMC qualification can prescribe independently and/or in a supplementary capacity (Royal College of Nursing, 2012; Cooper et al., 2008).

<sup>aa</sup> The authors do not specify the categories of clinical team members whose attitudes were explored.

a negative impact on the workload of other team members, and there appeared to be confusion about the role of supplementary prescriber nurses in a clinical team.<sup>36</sup> No further information was provided.

- In a 2004 literature review on the effectiveness of nurse prescribing, Latter and Courtenay cited a small scale study<sup>bb</sup> on GPs' and 'practice nurses' views of the potential impact of extended nurse prescribing, which found that GPs had concerns about possible erosion of their role, and threats to their status and authority.<sup>37</sup>
- A 2009 literature review by Creedon et al. found that out of eight studies related to the impact of nurse prescribing on interpersonal relationships between nurses and doctors/other professionals, four reported that nurse prescribing enhanced such relationships, two identified findings illustrating hierarchical relationships and poor communication between nurse prescribers and other medical professionals, and two were neutral.
  - The authors noted that among the two studies illustrating a potential negative impact on nurse-physician relationships, one of the two studies reported findings that drew upon interviews with GPs who lacked knowledge on the training of prescribers.<sup>38</sup> The authors did not provide any further details of the studies.
- A 2009 evaluation of the expansion of nurse prescribing in Scotland by Watterson et al. found that nurse prescribers' public health contributions were recognized by medical and nursing staff. The benefits to infection control and better treatment of conditions without the use of anti-microbial drugs or with more careful targeting of microbial drugs were also recognized. Nurses found that they had further and more expanded roles, for example in smoking cessation and sexual health areas.<sup>39</sup>

### 4.3. Perceptions of Patients and Members of the Public on Nurse Prescribing

The literature identified in this review generally reported favourable attitudes among patients and the public regarding nurse prescribing; in some cases, nurse prescribing was seen by patients/the public as having advantages over physician prescribing.

#### 4.3.1. General Perceptions of Patients and Members of the Public

Five literature reviews and one individual study found that patients' perception of nurse prescribing was positive, in general. For example:

- A 2009 national independent evaluation of Ireland's Nurse and Midwife Prescribing Initiative<sup>cc</sup> by Drennan et al. found that approximately 100% of patients surveyed were in favour of nurses and midwives prescribing medications. Patients also reported,
  - That they felt nurse prescribing had reduced their waiting time for treatment;
  - High levels of satisfaction with the consultation with their nurse prescriber; and
  - High levels of intent to comply with the prescription provided by the nurse prescriber.<sup>40</sup>
- In a 2011 literature review by Bhanbro et al., two studies reported on acceptability of nurse prescribing, from the perspective of patients. The studies found that non-medical prescribing was widely accepted and viewed positively by patients. For example,

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<sup>bb</sup> No further details were provided on the methodology of this research.

<sup>cc</sup> This initiative was introduced under the Republic of Ireland's *Medicinal Products Regulations* in 2007, allowing for independent nurse and midwife prescribing (Naughton et al., 2013).

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- A UK-based qualitative study of 50 patients from caseloads of health visitors,<sup>dd</sup> district nurses,<sup>ee</sup> and a practice nurse<sup>ff</sup> reported that 49 out of 50 study participants were in favour of nurse prescribing and happy with the consultation and information provided by the nurse prescribers.
- Similarly, another UK based study interviewed a sample of 148 patients selected from the caseloads of district nurses, health visitors, and practice nurses after a treatment episode involving a nurse prescriber. The majority of patients interviewed post-prescribing implementation were in favour of nurse prescribing<sup>gg</sup> and 55% of patients interviewed had sought advice from a nurse prescriber in preference to the GP.<sup>41</sup>
- A 2014 systematic review by Gielen et al. found that patients were generally more satisfied or equally satisfied with the care provided by a nurse compared to traditional care provided by a physician.<sup>hh</sup> Out of a total of 13<sup>ii</sup> relevant studies cited by the authors,
  - Seven<sup>jj</sup> studies found that patients were more satisfied with care received from nurses than from physicians;
  - Four studies found satisfaction was the same for both.<sup>42,kk</sup>
- A 2009 literature review by O'Connell et al. reported on nine studies related to patients' perspectives on nurse prescribing, eight from the UK and one from Australia. Findings were generally positive, with the majority of patients in favour of nurse prescribing; however, methodologies were quite diverse, making it difficult to draw conclusions. For example:
  - Two studies found that patients were, in some instances, more satisfied with nurses' consultations than doctors.
  - One study of the general public (i.e., people who had not yet experienced nurse prescribing), expressed confidence in nurse prescribing.
  - The remaining six studies were generally positive, in terms of patients' views of nurse prescribing.<sup>43</sup>
- A 2008 review by Cooper et al. found that very little research had been done that explored the experiences and opinions of the actual supplementary prescribing patient, despite

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<sup>dd</sup> Health visitors are community-based nurses who work with parents and families in a variety of settings, including clients' homes, children's centres, health clinics and physician's offices ([National Health Service, n.d.](#)).

<sup>ee</sup> District nurses provide direct care to patients and their family members in their homes or residential care settings ([National Health Service, n.d.](#)).

<sup>ff</sup> Practice nurses (also known as general practice nurses) work in doctors' offices as part of a primary healthcare team. Prescribing may be carried out by senior practice nurses ([National Health Service, n.d.](#)).

<sup>gg</sup> Sample size was not specified.

<sup>hh</sup> The authors of this systematic review do not specify the category of nurse examined within the individual studies included in their review. In examining the reference list for the systematic review, it appears that at least 14 studies cited are specific to nurse practitioners. No other information was provided.

<sup>ii</sup> It should be noted that based on an examination of the reference list, five of these 13 studies cited investigated prescribing by nurse practitioners. No further details were provided.

<sup>jj</sup> It should be noted that based on an examination of the reference list, two of these seven studies cited investigated prescribing by nurse practitioners. No further details were provided.

<sup>kk</sup> Based on examination of the reference list, one of the four studies cited investigated prescribing by nurse practitioners; the remaining two studies (identifying less or mixed satisfaction findings) were specific to prescribing by nurse practitioners.

- supplementary prescribing being a three-way agreement between doctor, prescriber, and patient.
- The views of the public were identified in one nurse supplementary prescribing study involving a small convenience sample of the general public who had not experienced supplementary prescribing. In this study, it was reported that the majority of participants would have confidence in a nurse prescribing for them. General concerns (rather than nurse-specific ones) that were cited included whether the correct medicine and dose had been prescribed and what side effects and interactions may occur.<sup>44</sup> No further details were provided.
  - A 2004 review of the literature by Latter and Courtenay found that patients are generally satisfied with nurse prescribing.
    - Aspects that patients considered to be positive included the length of the relationship and regularity of contact with the nurse, accessibility and approachability, the nurse's style of consultation and information provision, and the expertise of nurses in certain areas such as skin and wound care. Other advantages identified by patients included convenience and speed of access to prescriptions.
    - In some cases, patients felt that nurses were in a better position to prescribe items from the Nurse Prescribers' Formulary than physicians because they knew the patient or the products better.<sup>ll</sup>
    - According to one study within Latter and Courtenay's (2004) review, the quality of the relationship between the nurse and patient was viewed positively according to patients' prescribing evaluation; aspects of this quality included the nurse providing reassurance, continuity of care, information and health promotion details, and being approachable.
      - Other benefits identified by patients included the provision of timely, convenient, practical, and successful treatment, as well as nurses' expertise in certain types of care.
      - Patients in this study also commented that nurse prescribing made more effective use of doctors' and nurses' time, and noted that nurses' awareness of their own professional limitations was a positive aspect of nurse prescribing.<sup>45</sup>

### 4.3.2. Patient Perception of Nurse Prescribing by Clinical Specialty

Some limited information was identified that reported on patients' experience and views of nurse prescribing in specific areas of clinical practice (e.g., dermatology, psychiatry). For example:

- **Dermatology:** A 2010 study by Courtenay et al. reported on the views of patients who had attended the clinics of seven dermatology specialist nurse prescribers. These patients reported that they believed that nurse prescribing improved access to, and efficiency of, dermatology services. Their reports placed emphasis on the value of telephone contact with nurses and the ability to access services locally.
  - According to the authors, information exchange and involvement in treatment decisions ensured that treatment plans were appropriate and motivated

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<sup>ll</sup> It should be noted, as pointed out by the authors, that the studies cited drew upon interviews with high users of nursing services, and therefore the findings may not be applicable outside this population (Latter and Courtenay, 2004).

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adherence. Similarly, nurses' specialist knowledge, interactive and caring consultation style, and continuity of care improved confidence in the nurse and treatment concordance.<sup>46</sup>

- **Psychiatry:** In a 2008 literature review on nurse supplementary prescribing in the UK, Cooper et al. identified a 2005 qualitative study involving service users, nurses, and psychiatrists involved in patients' care. The authors of the study identified that service users reported the opinion that nurse supplementary prescribing was beneficial because mental health nurse prescribers listened, gave information on medication, and allowed focus on collaboration and treatment options.<sup>47</sup>

### 4.3.3. Patient Perception of Health Care Access Related to Nurse Prescribing

Limited information was identified regarding the impact of nurse prescribing on access to health care services. In particular, four studies included in a 2011 systematic review by Bhanbro et al. considered nurse prescribing in primary care from an access perspective, and suggest that, from the patient's perspective, nurse prescribing increased access to health care services. For example:

- A 2010 UK-based qualitative study, which interviewed 41 patients from caseloads of seven nurse prescribers, reported that patients thought that their access to medicine had improved during non-routine/non-emergency appointments.
- A 1998 UK study, which interviewed 305 patients selected from the caseloads of nurse prescribers, reported that patients appreciated the accessibility of nurses, resulting in no delay in starting medication.<sup>48</sup>

*Please take the time to complete an anonymous two-minute [Literature Review Survey](#) to inform us how this review met, or did not meet, your needs.*

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