Clinical decision-making in nursing advanced practice: A case study from general practice

Advanced nurse practitioners practice at a higher level of capability as autonomous and independent healthcare providers. This article looks at their role as clinical decision makers.

ABSTRACT

This case study highlights the advanced nurse practitioner's (ANPs) role in clinical decision-making, evidence-based practice, ethical care and antimicrobial stewardship. It demonstrates an understanding and the application of clinical decision making (CDM) in practice, highlighting the strengths and weaknesses of various models. The case study focuses on the management of urinary symptoms in a non-pregnant adult female patient attending a general practice nurse-led service. Combining the analytical and intuitive elements of cognitive continuum theory and applying the metacognitive 'think and think again' approach challenged the ANP's existing model of decision making resulting in shared and collaborative decision-making. The case study balances clinical guidelines with patient concerns, considering interpersonal, environmental, and intrapersonal factors in decision-making; and reflects on challenges, ethics, and contemporary healthcare issues, particularly in relation to antimicrobial stewardship.

Key words | Education | Ethical | Care | Stewardship

Advanced Nurse Practitioners (ANPs) play an important role in navigating complex clinical scenarios, integrating decision-making models with ethical considerations and evidence-based practice to deliver comprehensive patient care (Lockwood et al., 2022). This paper explores the ANP's role in clinical decision-making, ethical care, and evidence-based practice and demonstrates how decision-making models were utilised to make important clinical decisions. It defines clinical decision-making (CDM) and its application in practice, outlining the strengths and weaknesses of various models. The case study highlights the ANP's management of urinary symptoms in a non-pregnant adult female, who requested antibiotics to address her symptoms, and highlights the ANPs role in diagnostic reasoning, ethical decision-making, and antimicrobial stewardship.

Balancing clinical guidelines with patient concerns, the case study considers interpersonal, environmental, and intrapersonal factors in decision-making, and reflects on challenges, ethics, and contemporary healthcare issues, particularly in relation to antimicrobial stewardship. Schön's model of reflection in and on action (Schön, 1983; Schön, 1987) played a key role in shaping the clinical decision-making process, enabling the ANP to critically reflect on practice and build self-awareness. This approach encouraged continuous learning by prompting the ANP to examine both their actions in real time (Schön, 1983) and their thoughts about those actions afterward (Schön, 1987), fostering deeper insights and improving clinical judgment.

Advanced nurse practitioners are highly skilled professionals who have completed advanced education and training at master's level and beyond, and practice at a higher level of capability as independent, autonomous, and expert practitioners (Nursing and Midwifery Board of Ireland, 2017; Ryder et al., 2022). Higher-order competencies, including critical thinking, research, and leadership, play a pivotal role in shaping advanced nursing practice. These skills enable ANPs to analyse complex clinical situations, apply evidence-based knowledge to decision-making, and lead healthcare teams effectively (Ryder et al., 2023).

ANPs are viewed as senior clinical decision makers conducting comprehensive assessments of patients with complex, multifaceted healthcare needs (Ryder & Gallagher, 2022; Carney et al., 2023). They can prescribe medications, order diagnostic tests, interpret results from various assessments, and make diagnoses. ANPs complete an episode of care, utilising advanced knowledge and skills to manage patient care effectively, often in collaboration

Dr Theresa Lowry Lehnen. Advanced Nurse Practitioner General Practice. South East Technological University, Ireland.

Dr Martin Duignan, Doctor of Nursing. Royal College of Surgeons Ireland (RCSI).

Barry McBrien, Assistant Professor of General Nursing. School of Nursing and Midwifery, Trinity College Dublin, Ireland

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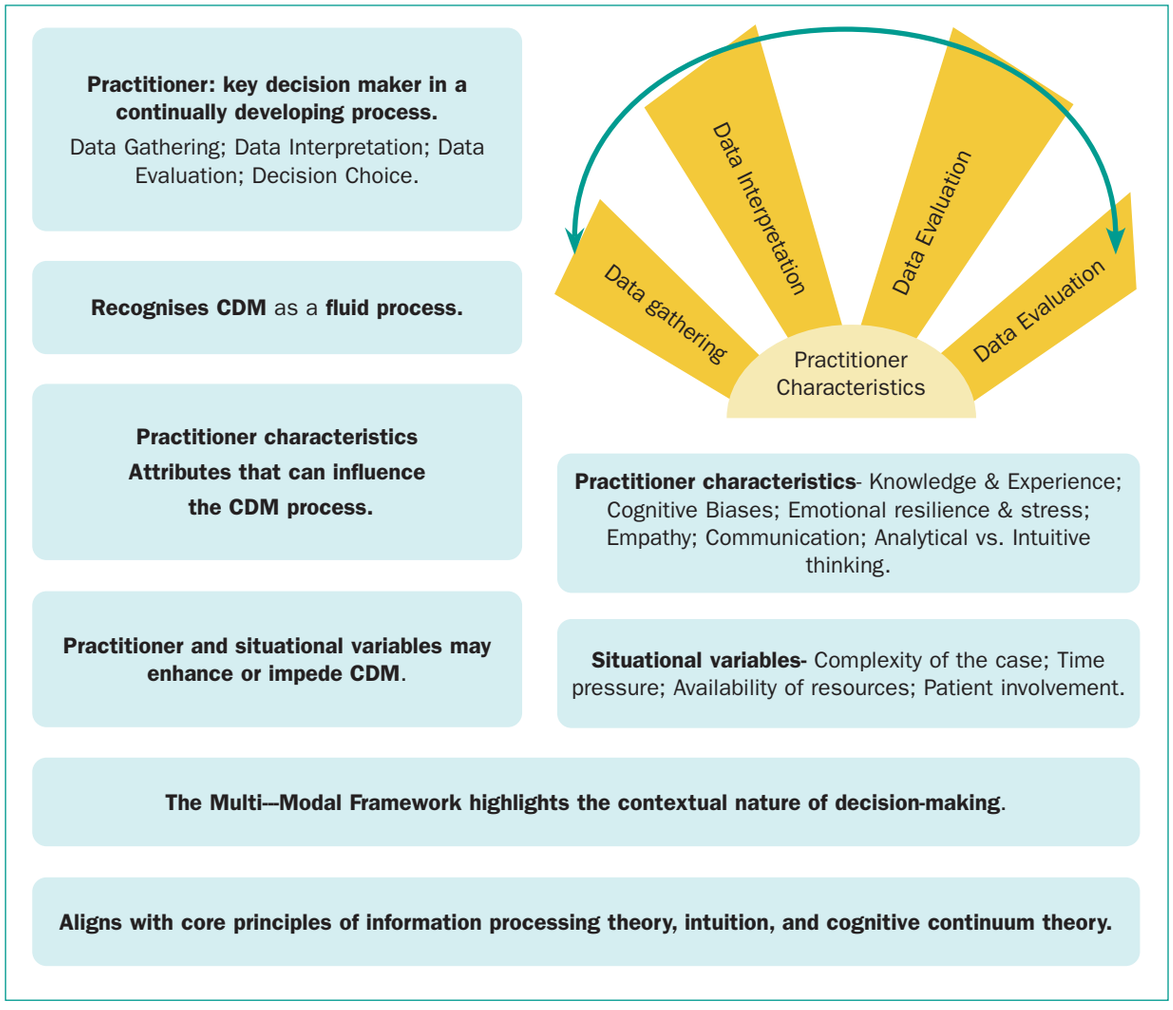

Figure 1. The multi-modal framework (Lowry Lehnen, T. 2024)

with multidisciplinary teams to ensure optimal patient outcomes (Thompson & McNamara, 2023; Clarke et al., 2023).

In this case study the ANP works in a primary care service in a nurse led medical centre in a higher education institute with a patient population of 10,500 third level students and 850 staff. Patient age ranges vary from 18 - 65+ years. The practice staff include three visiting GPs and one full-time ANP. The medical centre has approximately 4,500 appointments annually and functions as a general practice with a focus on minor illness, minor injury, and chronic disease management.

Antimicrobial Stewardship

Antibiotic misuse and over-prescribing are significant global health concerns, contributing to the rise of antibiotic resistance (WHO, 2023). More than 35,000 people die each year due to antibiotic resistance across Europe (Brannigan, 2024). A key contributing factor to antibiotic overuse is the demand healthcare professionals (HCPs), including ANPs, often face from patients who expect antibiotics for conditions where they are ineffective or unnecessary (Murphy et al., 2024). Healthcare professionals are often in a challenging position between adhering to medical guidelines and meeting patient expectations, a dynamic that contributes to the overprescribing of antibiotics, exacerbating the problem of antimicrobial resistance (European Centre for Disease Prevention and Control, 2024). Antibiotic resistance is now considered one of the most pressing challenges to public health worldwide, with the potential to undermine the effectiveness of many standard treatments (WHO, 2023).

Approximately 80% of antibiotic prescribing in Ireland is conducted in general practice (Devine et al., 2022). Patient demands, expectation, familiarity with the clinician and time restraints have been documented as key factors for overprescribing antibiotic therapy in general practice, despite clinical evidence suggesting that it is not necessary (Murphy et al., 2024). Efforts to reduce unnecessary antibiotic prescribing in Ireland include: education and training for prescribing healthcare professionals; implementing decision support tools (DST); using point-of-care testing (POCT); and supporting evidence-based practice through audit and evaluation. Initiatives also promote delayed prescribing where possible, evaluating its effectiveness, identifying barriers, and enhanced adoption

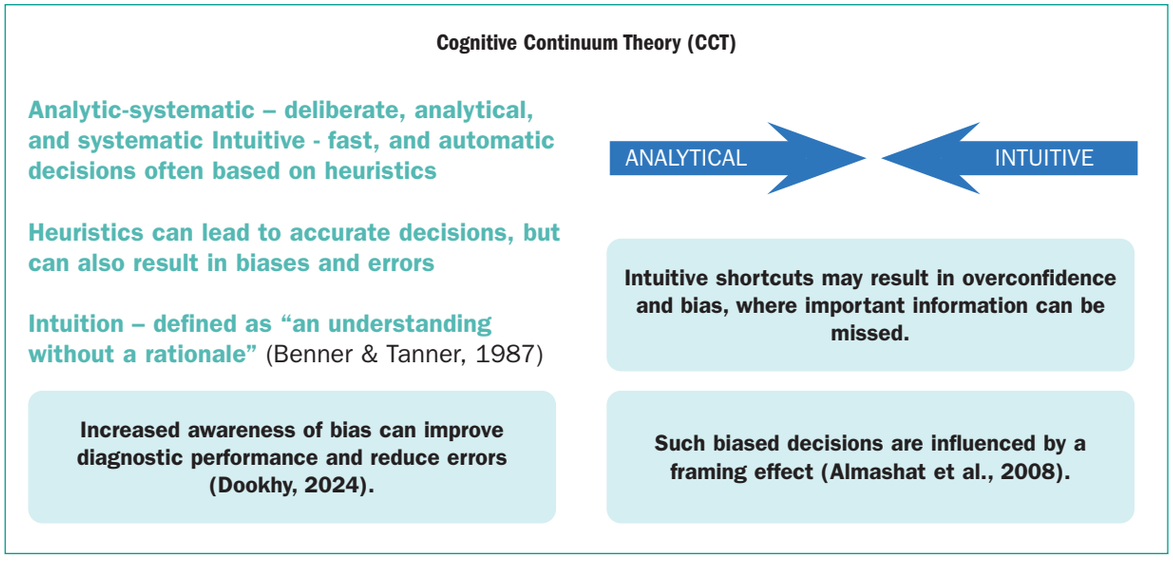

Figure 2. The cognitive continuum theory (Lowry Lehnen, T. 2024)

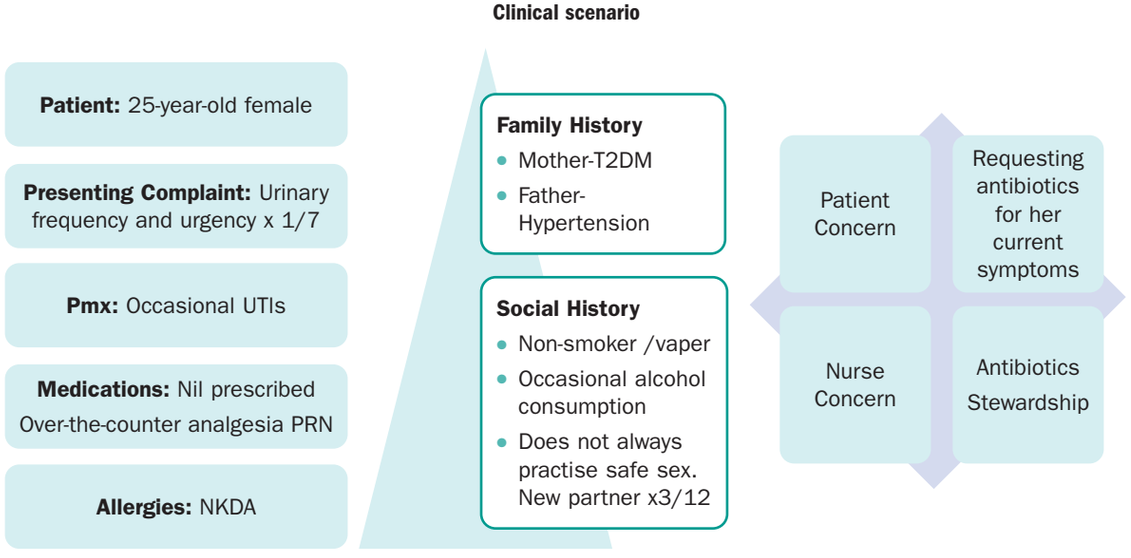

Figure 3. Case study (Lowry Lehnen, T. 2024)

through behavioural science approaches (Murphy et al., 2024).

All prescribing HCPs have an ethical responsibility to prescribe antibiotics judiciously to reduce the risk of resistance (Parzen-Johnson et al., 2023). This requires a comprehensive understanding of the core principles of antibiotic selection – including the underlying pathology, and the therapeutic characteristics of the prescribed agents – ensuring that treatment is evidence-based, safe, and cost-efficient (Nursing and Midwifery Board of Ireland, 2019). Advanced practice education programmes equip ANPs with these competencies (NMBI, 2019). Ethical practice also encompasses a commitment to antimicrobial stewardship and the responsibility to effectively communicate with and educate patients when antibiotics are not indicated (Murphy et al., 2024). Practice standards, decision-making frameworks, clinical governance structures and the regulatory body outline the criteria for safe and effective nurse prescribing practice. Good prescribing practice should optimise patient outcomes, support patient care and encourage treatment concordance and adherence while considering clinical response, tolerability, and lifestyle factors. Patients should be included in clinical decision-making processes, informing them of available options, while ensuring that prescriptive practice is safe, evidence based, appropriate and in the patient's best interest (NMBI, 2019; Health Service Executive, 2020).

Clinical decision-making definitions

Clinical decision making (CDM) is a contextual,

continuous, and evolving process, where data are gathered, interpreted, and evaluated to select an evidence-based choice of action (Tiffen et al., 2014). It is a commonly used term to describe the core responsibilities of the ANP (NMBI, 2017). Clinical decision making includes critical thinking, clinical reasoning and clinical judgement (Ryder et al., 2023) and has been described in multiple ways by various authors, such as a process of choosing between alternatives or options (Thompson & Stapley, 2011), a series of decisions (Lauri & Salantera, 1998), a series of judgments (Higgs et al., 2011), the ability to identify, prioritise, and establish a plan (Grossman, Campbell, & Riley, 1996), a problem-solving activity (Higuchi & Donald, 2002) and the formulation of hypotheses or nursing interventions (Shin, 1998; Tschikota, 1993). These definitions and descriptions collectively emphasise that clinical decision-making is both a continuous and essential process central to the practice of ANPs.

Clinical decision-making models

Decision analysis theory is a prescriptive model which involves identifying problems, exploring options, and evaluating potential outcomes. This approach leads to a decision guided by individual preferences (Raiffa, 1968; Donahue & Martin, 1996). It assumes that better awareness leads to improved decision-making and patient care. However, it is criticised for being linear, ignoring clinician experience, patient factors, and situations with multiple valid decisions (Marks-Maran, 1999; Gerdtz & Bucknall, 1999).

The Multimodal Framework (Tiffen et al., 2014), (Figure 1) depicts the practitioner as the primary decision maker in an evolving process of data gathering; data interpretation; data evaluation; and decision choice. It recognises CDM as a fluid rather than linear process. Practitioner characteristics – such as knowledge and experience, cognitive biases, emotional resilience, stress, empathy, communication, and analytical versus intuitive thinking – are attributes that influence how the practitioner engages in the CDM process. Variables – including practitioner and situational characteristics such as time pressure, availability of resources, and patient involvement – may strengthen or hinder clinical decision-making. The multi-modal framework highlights the contextual nature of decision-making, and aligns with core principles of information processing theory, intuition, and cognitive continuum theory (Tiffen et al., 2014).

The Cognitive Continuum Theory (CCT) (Figure 2) asserts that human decision-making exists on a spectrum between intuitive and analytical processes (Dunwoody et al., 2000). Analytical is systematic and deliberate. Intuitive or interpretive is fast, and automatic decisions, often based on heuristics, and defined by Benner & Tanner (1987), as an understanding without a rationale. Heuristics can lead to accurate decisions but concomitantly result in biases and errors. Intuitive shortcuts can lead to overconfidence and bias where important information is overlooked.

Analytic-systematic approach
History: patient questioned about the onset, nature, severity of symptoms, sexual activity, STIs, use of contraceptives, history of previous UTIs /relevant conditions.
Physical examination: No suprapubic tenderness or gynecological issues noted.
Brief systemic enquiry: Cardiovascular: NAD; Respiratory: NAD; Gastrointestinal: NAD; Neurological: NAD; Musculoskeletal: NAD; Dermatological: NAD.
Vital Signs: Stable, within normal parameters.
Investigations: Urine dipstick test. MSU sent to the microbiology lab for culture & sensitivity.
Dipstick: Positive for leucocytes (trace), all others NAD.
The urine is concentrated. HCG = negative.
Initial Impression: Cystitis.
Differential Diagnosis (Reinoso et al., 2018).
Overactive Bladder (OAB); Interstitial Cystitis; Vaginitis or Urethritis; Psychogenic Urinary Symptoms (Anxiety-related); Diabetes Mellitus; Diabetes Insipidus; Pelvic Organ Prolapse; Medication-induced (Bono et al., 2024).
Initial Decision: ANP would not prescribe antibiotics.
Following clinical guidelines for managing UTIs, based on HSE Antibiotic Prescribing Guidelines and local resistance patterns. (HSE 2024). Wait until culture results are available.
Patient Education: increased fluids, reduced caffeine products, safe sexual practices, OTC preparations for cystitis symptoms.
Opportunistic STI screening performed based on the patient's risk factors.

Figure 4. The analytic systematic approach (Lowry Lehnen, T. 2024)

Metacognitive approach		
Adopting a rational analytical process, in response to intuition.	'think and think again' (Smyth & McCabe, 2016)	"Am I overlooking something"?
Cognitive bias may lead to premature closure bias. Anchoring bias – tendency to rely on one piece of information, usually the first – when making decisions (Phelan, 2024).		
Situational Awareness (Stubbings et al.,2012). Patient's perceived 'need' for antibiotics.		Clear communication, information and education.
Open to modifying decision based on situational factors. Consideration of alternative management strategies.		

Figure 5. The metacognitive approach (Lowry Lehnen, T. 2024)

Such biased decisions are influenced by a framing effect (Almashat et al., 2008), causing individuals with the same

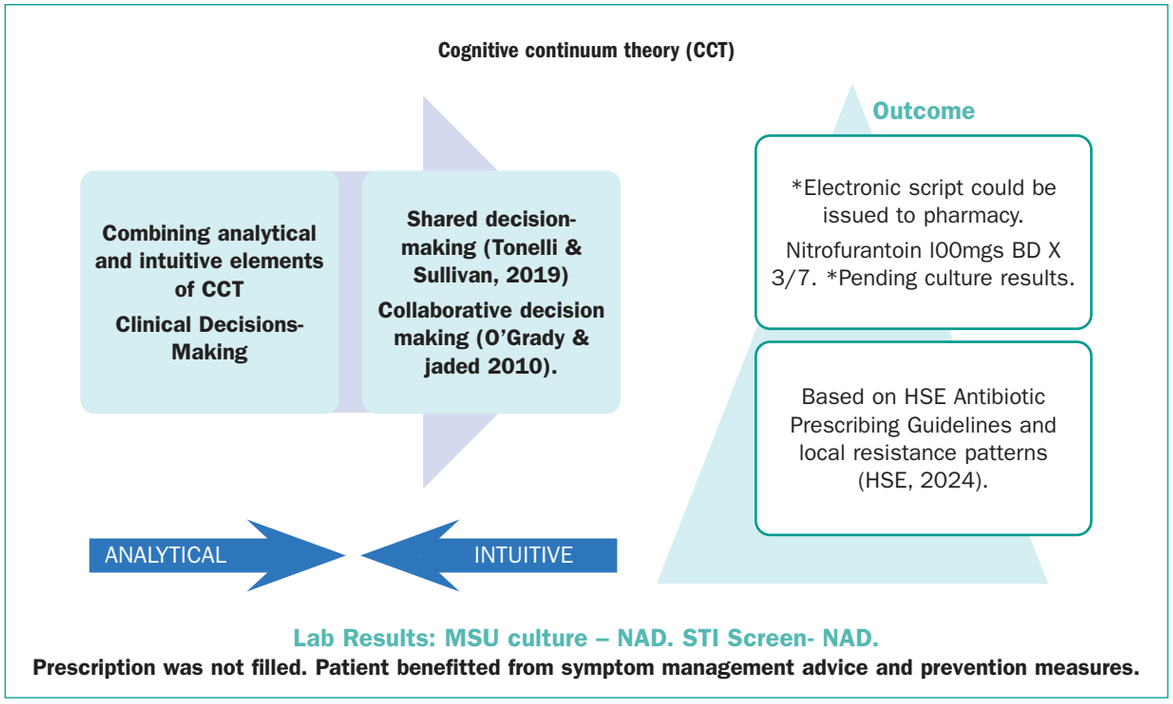

Figure 6. Analytical and intuitive elements of CCT (Lowry Lehnen, T. 2024)

Ethical considerations
Antibiotic stewardship: Ethical responsibility to prescribe antibiotics appropriately to reduce resistance risk. Understanding of the key criteria for antibiotic selection, pathology of UTIs, and the therapeutic profile of chosen agents, ensuring treatment is rational, safe, and cost-effective.
Address patients concerns: Heightened anxiety about the 'need' for antibiotics.
Clear communication: Delayed script - electronic script could be issued to pharmacy, *pending culture results.
Risks and benefits of treatment options, including potential side effects.
Informed consent: Patient understands and agrees the treatment plan and can ask questions before proceeding with treatment.

Figure 7. Ethical considerations Lowry Lehnen, T. 2024)

Contemporary healthcare issues – Antimicrobial stewardship
Antibiotic resistance in UTI pathogens is a growing challenge
• **Cautious use** of antibiotics
• Choice of **empirical therapy** - governed by **local resistance rates**.
• **ANPs** are pivotal in promoting **responsible** antibiotic use.
• Key players in **educating the community** about misuse.
• Managing **patient expectations** and using **strategies** to deal with patient demands for **'quick fix'** antibiotic prescriptions.
• **Accurate diagnosis** and **delayed prescribing** when necessary.
• **Minimising unnecessary** antibiotic prescriptions.
• ANP **leadership** in antimicrobial stewardship across settings. (Bankar *et al.*, 2022)

Figure 8. Contemporary issues (Lowry Lehnen, T. 2024)

clinical information to make different diagnostic and treatment decisions.

Clinical Case Study

A 25-year-old female patient (Figure 3), presented to an advanced nurse practice service with a one-day history of urinary frequency and urgency. The patient reported a history of occasional urinary tract infections (UTIs), was taking no prescribed medication, and was using over the counter (OTC) analgesia to manage the symptoms of the UTI. She had no known drug allergies, and the familial history included Type 2 Diabetes Mellitus (T2DM) and hypertension.

Social History: The patient reported being a non-smoker/vaper; occasional alcohol consumption; and stated she had an inconsistent adherence to safe sex practices. She had a new partner for the past three months.

In this case study the concern is that the patient was 'insisting' on antibiotics for her symptoms, stating that she had always received antibiotics for similar symptoms on previous visits to the primary care service. The ANPs concern was the provision of evidence based optimal care and antibiotic stewardship.

Conducting a thorough clinical assessment is central to advanced nursing practice, forming the foundation for accurate diagnosis, effective treatment planning, and optimal patient outcomes (Innes, Dover, & Fairhurst, 2018). This requires advanced skills in critical thinking, clinical judgement, and decision-making, enabling ANPs to interpret complex clinical information and provide care that is person centred (Innes, Dover, & Fairhurst, 2018; Ryder et al., 2023).

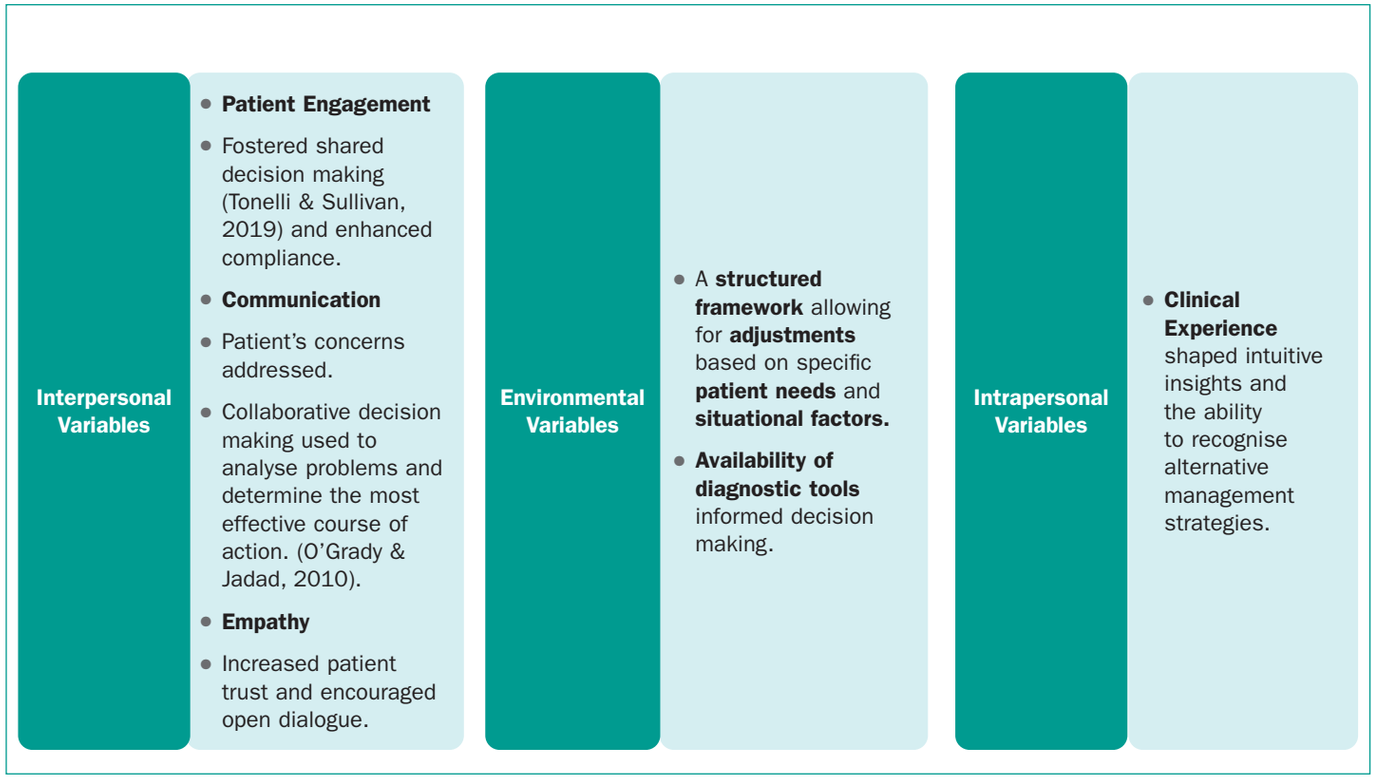

Figure 9. Interpersonal, environmental, and intrapersonal factors (Lowry Lehnen, T. 2024)

In clinical practice, the ANP's usual approach to clinical decision making is the analytic systematic approach (Figure 4). The Calgary-Cambridge model was also utilised by the ANP as it provided a framework for physical assessment and clinical interactions, focusing on enhanced patient-provider communication, and ensuring a structured, patient-centred approach to physical examination (Mellors & MacArthur, 2024).

A comprehensive history, physical examination and brief systemic enquiry was carried out.

History: The patient was questioned about the onset, nature, and severity of symptoms, sexual activity, sexually transmitted infections (STIs), use of contraceptives, history of previous UTIs /relevant conditions.

Physical examination: No suprapubic tenderness or gynecological issues were detected.

Brief Systemic Enquiry: The brief systemic enquiry revealed no abnormalities detected (NAD) in the cardiovascular, respiratory, gastrointestinal, gynaecological, neurological, musculoskeletal, and dermatological systems.

Investigations: The patient's vital signs were stable, within normal parameters. A urinalysis dipstick test was carried out and a midstream specimen of urine (MSU) was sent to the microbiology laboratory for culture and sensitivity. The dipstick test was positive for a trace of leucocytes. The urine was concentrated, and the human chorionic gonadotropin (HCG) test was negative.

Initial Impression: The ANP diagnosed cystitis, based on the patient's symptoms, history, examination and urine dipstick results. It is not unusual to find leucocytes in concentrated urine (Health Service Executive, 2021; Lemos, 2024). Cystitis is an inflammation of the bladder that can occur without an infection. It is categorised as a lower urinary tract infection not always requiring antibiotic therapy. The symptoms may improve with supportive care such as hydration, analgesia and over the counter cystitis preparations. It is important to distinguish cystitis from a bacterial UTI to ensure appropriate treatment, as not all cases involve infection (Van Horrik et al., 2024).

Differential Diagnosis was considered to exclude any condition with similar symptoms (Reinoso, Bartlett, & Bennett, 2018). Differential diagnosis in this case includes overactive bladder; interstitial cystitis; vaginitis or urethritis; psychogenic urinary symptoms; diabetes mellitus; diabetes insipidus; pelvic organ prolapse; and medication-induced (Bono et al., 2024).

The differential diagnoses were excluded through targeted clinical evaluation. Overactive bladder was excluded by assessing urgency frequency patterns and lack of structural abnormalities. Interstitial cystitis was excluded through the absence of hallmark symptoms such as persistent pelvic pain. Vaginitis or urethritis was excluded due to no physical signs of infection or inflammation detected in the vaginal or urethral areas. Psychogenic symptoms were excluded as the absence of situational triggers or chronic stressors reduced its likelihood (Bono et al., 2024). Recent patient laboratory records indicated normal glucose and haemoglobin A1c (HbA1c) levels, reducing the likelihood

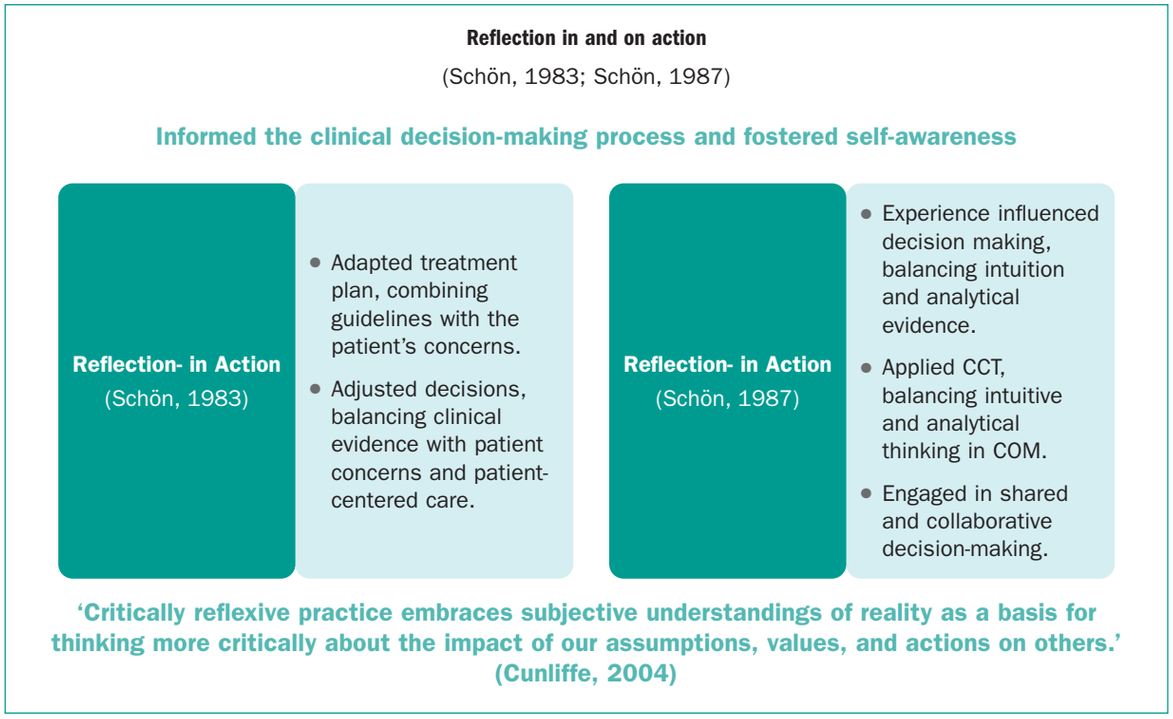

Figure 10. Reflection in and on action (Lowry Lehnen, T. 2024)

of diabetes mellitus as a contributing factor. Diabetes insipidus was considered less likely due to the absence of classic symptoms such as excessive thirst and polyuria. Pelvic organ prolapse was excluded through a pelvic examination, which demonstrated normal anatomical positioning. Reviewing the patient's medication history excluded medication induced symptoms as no diuretics or other medications linked to urinary symptoms were prescribed (Bono et al., 2024).

Clinical Decision: The ANPs initial clinical decision was not to prescribe antibiotics, following standard treatment protocols and clinical guidelines for managing UTIs, based on local antibiotic prescribing guidelines and community resistance patterns (HSE, 2024) and wait until the culture and sensitivity results were available.

Education was provided on increased fluids, reducing caffeinated products, safe sexual practices, and OTC preparations for cystitis symptoms.

Opportunistic STI screening was provided based on the patient's risk factors, including inconsistent safe sex practices and having a new partner for the past three months, which contributed to the decision-making process for offering the screening.

Metacognition (Figure 5) refers to the awareness and regulation of one's own thinking processes. The concept of metacognition plays a key role in enhancing clinical decision-making by encouraging practitioners to reflect on decisions, consider alternative options, and re-evaluate conclusions (Pikouli et al., 2023). Adopting a rational analytical process, in response to intuition, the ANP was encouraged to "think and think again' (Smyth & McCabe, 2016) 'Could I be missing anything, is there anything else going on here'? Cognitive bias could contribute to a premature closure bias, where a singular specific diagnosis is reached, and thinking stops. Anchoring bias (Phelan, 2024) is a tendency to rely on a single component of patient data, while making decisions. To safeguard against anchoring bias the ANP reassessed the patient.

Using situational awareness (Stubbings et al., 2012) regarding the patient's heightened anxiety and 'need' for antibiotics, the ANP provided information and education to address the patients concerns. The ANP was open to modifying their decision based on situational factors and considered alternative management strategies while being guided by clinical evidence.

The combination of the analytical and intuitive elements of CCT (Figure 6) influenced the ANP's clinical decision-making through shared and collaborative decision making with the patient. The patient was a partner in the discussion, where the risks and benefits of immediate versus delayed antibiotic use were explained. Consensus was achieved, and both stakeholders decided to wait for the culture results before commencing antibiotics, unless the patient's symptoms worsened. A prescription could be issued electronically to the pharmacy for Nitrofurantoin 100mgs (prolonged release) twice daily (BD) for three days (3/7), pending the culture results and based on local antibiotic prescribing guidelines and community resistance patterns (HSE Antibiotic Prescribing, 2024; Murphy et al., 2024).

Outcome: The MSU culture and the STI screen reports were normal. The prescription was not required and the

patient benefitted from symptom management, advice, and prevention measures.

Ethical considerations

Antibiotic stewardship: Advanced Nurse Practitioners have a responsibility to prescribe antibiotics appropriately to reduce resistance risk. This involves an understanding of the key criteria for antibiotic selection, pathology, and the therapeutic profile of chosen agents, ensuring treatment is rational, safe, and cost-effective. Ethical responsibility also includes antimicrobial stewardship and clear communication and education for patients when antibiotics are not necessary (Parzen-Johnson et al., 2023). This responsibility extends beyond ethics to include practical aspects of patient care and health promotion.

Addressing the patients concerns: Heightened anxiety about the 'need' for antibiotics.

Clear communication: Delayed script pending culture results. Risks and benefits of treatment options, including potential side effects.

Informed consent: Ensuring the patient understands and agrees the treatment plan and can ask questions before proceeding with treatment.

Contemporary health care issues

Advanced nurse practitioners (ANPs) play a leading role in antimicrobial stewardship by reducing unnecessary antibiotic prescriptions and promoting realistic treatment expectations among patients. This involves implementing evidence-based approaches to challenge the misconception of antibiotics as a 'quick fix,' fostering responsible and effective prescribing practices. Antibiotic resistance in UTI pathogens is a growing challenge (Bankar et al., 2022). Cautious use of antibiotics and choice of empirical therapy governed by local resistance rates is important. ANPs are pivotal in promoting responsible antibiotic use and are key players in educating the community about misuse (Bankar et al., 2022).

Interpersonal, environmental, and intrapersonal factors

Interpersonal variables (Figure 9) promoted patient compliance through ANP clear communication, empathy, and shared decision making (Tonelli & Sullivan, 2019) and collaborative decision making (O'Grady & Jadad, 2010) with the patient. Environmental variables, including a structured framework allowing for adjustments, and diagnostic tools supported the ANP's informed decisions. Intrapersonal variables, including clinical experience, framed the ANP's intuitive insights and alternative management strategies

Reflection in and on action (Schön, 1983; Schön, 1987) (Figure 10), informed the ANP's clinical decision-making process and fostered self-awareness. Reflecting in action (Schön, 1983), the ANP adapted the treatment plan by balancing clinical guidelines with the patient's concerns, ensuring person-centred care. Reflecting on action (Schön, 1987), the ANPs experience shaped their decision-making, integrating intuition with analytical evidence. The ANP applied the cognitive continuum theory, blending intuitive and analytical thinking in clinical decision making, and engaged in shared decision making (Tonelli & Sullivan, 2019) and collaborative decision making (O'Grady & Jadad, 2010) with the patient.

KEY POINTS

- Advanced Nurse Practitioners (ANPs) play a pivotal role in clinical decision-making, ethical care, and evidence-based practice.
- This case study highlights the integration of analytical and intuitive clinical decision-making approaches and demonstrates the ethical and professional challenges in balancing evidence-based guidelines with patient expectations.
- ANPs have an ethical responsibility to prescribe antibiotics appropriately to reduce resistance risk. This involves an understanding of the key criteria for antibiotic selection, pathology, and the therapeutic profile of chosen agents, ensuring treatment is rational, safe, appropriate and cost-effective.
- Shared and collaborative decision-making enhances patient engagement and builds trust.
- Reflective practice enables ANPs to evaluate and improve their clinical reasoning, decision making and professional practice.

CPD REFLECTIVE QUESTIONS

- How do you address patient expectations for antibiotics when they are not clinically indicated, and what strategies do you use to effectively communicate your decision?
- As an ANP involved in antimicrobial stewardship, how do you evaluate the risks and benefits of prescribing antibiotics for certain conditions, and what factors influence your decision to prescribe, delay or withhold treatment?
- What are the challenges you face when using clinical decision-making models, such as Decision Analysis Theory or the Multi-Modal Framework, in practice? How do you adapt these models to your clinical decision-making process?
- Reflect on a time when you felt cognitive bias (e.g., confirmation bias, anchoring bias) might have influenced your clinical decision-making. How did you overcome this to make a more informed decision?
- How can you develop your clinical judgment and critical thinking skills in managing patients where antibiotic use is contentious, and how do you evaluate the effectiveness of your decision-making (example through feedback mechanisms such as audit and peer review) to improve your practice?

Conclusion

This case study highlights the ANP's role in clinical decision-making, ethical care, and evidence-based practice. It demonstrates an understanding and the application of

CDM, evaluating the strengths and weaknesses of various models. Integrating cognitive continuum theory and the 'think and think again' approach, challenged the ANPs existing model of decision making and resulted in shared and collaborative decision-making. The ANP balanced clinical guidelines with patient concerns, considering interpersonal, environmental, and intrapersonal factors in decision-making. This approach also required critical reflection on multifaceted challenges, ethical considerations, and contemporary healthcare issues as they pertain to patient concerns and the broader context of antibiotic stewardship.

The effective management of antibiotic prescribing requires a nuanced approach that balances clinical evidence with patient-centred care. ANPs are stakeholders in addressing the global challenge of antibiotic resistance through ethical decision-making, antimicrobial stewardship, and informed communication. The case exemplifies the integration of evidence-based practice, critical thinking, and collaborative decision-making to achieve optimal patient outcomes while promoting responsible antibiotic use.

Future research opportunities for ANPs could focus on strategies to address patient expectations for antibiotics in cases where they are unnecessary. This may include exploring the effectiveness of communication frameworks, shared decision-making approaches, and behavioural interventions to reduce inappropriate antibiotic prescribing, while concomitantly addressing the psychological and cultural factors that influence patient demand and ANP prescribing behaviours. **PN**

Conflict of Interest Statement: The author declares no conflicts of interest.

Ethical Approval: All procedures were performed in compliance with relevant laws and institutional guidelines, and the appropriate institutional committee has approved them.

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