Drug informatics

Faculty of Pharmaceutical Sciences

Lecture 3 and 4

Structure approach for effective Systematic response (1,2)

MIRACLE
Academy

قال تعالى (يَرْفَعِ اللّهُ الَّذِينَ آمَنُوا مِنكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ)

تفريغ المعلوماتية
زميلتكم بتول حازم

لجان الدُّفعات

Systematic Approach to Answer Drug Questions

1. Secure demographics of requestor.
2. Obtain background information.
3. Determine and categorize ultimate question.
4. Develop strategy and conduct search.
5. Perform evaluation, analysis, and synthesis.
6. Formulate and provide response.
7. Conduct follow-up and documentation.

1. Request Demographics

1. The requestor's "profession" (e.g., physician, pharmacist, nurse, lay person) should indicate **educational experience and knowledge base**; therefore, the individual receiving the query can use this information to determine the appropriate mannerism (in terms of educational level) to formulate and deliver the response.

1. Request Demographics

2. **Obtain telephone #, address, fax, etc for follow-up later.**

3. **Determine approximate age** (elderly, adolescent, etc.) (usually no need to directly ask).

4. **Communication skills.**

أيضاً في الـ Request لازم نعرف أساس الـ patient هنا نأخذ عنوانه، رقم الـ fax, رقم التليفون تبعه demographics

الـ Address، الـ fax .. نقيس للـ 7 elements معه نحتاجها لوجه follow up

وبالتالي لأجل Later follow up لأنه يحتاج طلبه رقم أو الرجعة أو طلب طبي أو الـ fax أو الـ Address الـ

2. determine approximate طبعاً .. لأنه نقدر نعرف السن بدون لأجل نحتاج نعرف الـ Age ..

Age

قد هو من old age في Adults

الـ EOS

Communication Skills ودي تساعدنا اللي بتكون علاقات الـ Requester أو الـ patient عشان

(حد = مهمة وقوية .. الـ Questioning & Listening

وأيضاً Pharmacist يجب أن نقدر نكون لنا الـ skills للـ نستعمل جيداً لأجل بحيث نحرف

طبعاً الأساس؟ السؤال، و كمان قادرين على تحتوي على الـ educational

level of the

Requester

EXAMPLE

If a patient and a physician inquired about how the new medication Prandin® works (i.e., pharmacology), the depth of the response would differ for each individual.

- For example, a pharmacist should not inform a lay person that the new medication is the first agent approved in the meglitinide class and is a nonsulfonylurea insulin releasing oral hypoglycemic agent for type 2 diabetes mellitus.

- This would not be an appropriate response because the lay person would be unfamiliar with this terminology. Similarly, the pharmacist would not communicate to the physician that the new medication "acts by improving the way your body processes sugar." The physician would require a more scientific description of the product.
- Determine **a method for delivery** of the response.
- **Gather information** from the requestor that will allow you to reply to the request.

Handwritten notes (Arabic/English):

شخص عادي Lay person ال بالكلام... unfamiliar يعني غير مألوف ال terminology يعني بالكلام وقتها

شخص اللي ال Requester يعني طلب ال ... ال Education Level يعني مستوى ال ثقافة او الطب ال علمي اذا لازم ال ... وه

Pharmacist يعني صيدلي Communicate يعني physician ال D ... drug الدواء ال او

قضية This drug acts by improving the way your body processes sugar يعني قضية

physician يعني ... physician ال [More Scientific description about this product]

2. Background Information

★ Think, "Why is requestor asking for this information?".
★ Weigh time involved to get background info.
★ Use tact, politeness and assertiveness.
★ Background questions should be specific for the nature of the request.
★ Ask, "What sources have already been used?".
★ Useful info: age, gender, weight, allergies, other disease states, other meds, lab values, etc.

WHY ??

- Background information aids in clarifying the question and is a critical step in the process.
- The question may not be stated concisely or the requestor may not know how to ask the question.
- To formulate an acceptable response, both the caller and researcher must have a clear understanding of the ultimate question.

EXAMPLE

A pharmacist is asked, "what is the dose of amoxicillin (Amoxil®)?"

- This question could be answered quickly (and potentially inaccurately) by stating that the normal dosage as 500 mg every eight hours.
- The question also could be answered by gathering background information concerning the origin of the question.

Example هو ال ... Pharmacist هو شخص يسأله ال Requester ... سأل ما هو ال dose

ال amoxicillin .. ال يكون الشخص سأل ال Pharmacist اللي يعني أن يسأله صحيح ودقيق ؟ the Normal dose of amoxicillin 500 mg every 8 hours.

وكذلك هو ... يعني أن أسأل gathering لـ for background information He couldn't answer in that way

Dose of amoxicillin بتختلف حسب باختلاف الـ age, weight, diseases ال dose of amoxicillin

ولو نأخذ على ال disease state ونعرفها disease ومعرفة ال Specific for that patient وكذلك ال gathering for background information الطبيب ومعرفة تاريخ الطبية ويعرف كل حاجه Pharmacist

- A pharmacist would not provide the most commonly dispensed dose of amoxicillin as the dose for all individuals and conditions.

- The dose of this antibiotic depends upon a number of factors. Determine if the question is in regard to a specific patient or general research in the treatment of a disease state.

- If the question is **patient specific**, important information to acquire would include the patient's age, weight, allergies, type of infection, concurrent disease states, other medications, and preferred dosage form (e.g., oral suspension, capsules, or chewable tablets). For example, amoxicillin may not be for a severe infection or 2 grams as a single dose one hour prior to dental procedures for bacterial endocarditis prophylaxis.

Determine and Categorize Ultimate Question

- Find _____
- How _____
- Use _____
- Determine_____

Examples of question classifications

1. Adverse Drug Reaction
2. Contraindication
3. Availability
4. Dose
5. Drug compatibility/stability
6. Drug interaction
7. Drug therapy
8. Identification
9. Pharmacy practice
10. Pharmacology

السؤال الـ Question لـ قد تختلف pharmacist عد السائل كالـ requester الـ سـ قد أسوال

يجب تقوم بعمل تصنيف (Classification) والأسئلة بها أنواع مثلاً هذا السؤال هل يسأل عن الـ Advers drug reaction أو Pharmacology؟ قد يسأل عن الـ dose؟ قد يسأل عن الـ drug interaction؟

أو يسأل عن الـ Adverse effect؟ وهذا قد يسأل عن احتياجها

مثلاً هل الـ دواء x أمن lا pregnancy .. فيجب عمل Classification of that question

Examples of question classifications

11. Tablet identification.
12. General product information.
13. Laws/policies/procedures, Cost, Foreign products.
14. Pharmaceutics (compounding, formulations).
15. Pharmacokinetics (ADME "absorption, distribution, metabolism, and excretion"/levels).
16. Nutrition support.
17. Adverse effects.
18. Poisoning, toxicology.
19. Pregnancy, Teratogenicity.
20. Lactation/ infant risks.

Example

Information gathered from the background questions concerning the request for the dose of amoxicillin (Amoxil®) allowed the actual question to be revealed as the dose and frequency of amoxicillin before a dental procedure for bacterial endocarditis prophylaxis in an 18 year old male.

Develop a time line for response

Completely understanding the scope of the "true" question also aids in developing a realistic estimate of the time required to compose a response.

Categorize the question

★ A vital step in the systematic approach.
★ Allows for efficient use of the resources by providing the foundation of a logical progression process.
★ An all-inclusive resource with data to answer every drug information question does not exist (References contain specific types of information).
★ Numerous topic specific resources are available (e.g, drug interactions, infectious disease, internal medicine).

Categorize the question

وطالما الـ Categorize الـ Question هو الـ Vital step والـ Systematic approach
كان لازم يكون عندنا reference يجاوب على كل الأستلة تقريباً ما في..

بس أكون عندي الـ reference المختص بالـ question اللي بسأله السائل requester..

Categorize the question

★ **Classification of a request aids in developing a more effective search strategy.**

★ **Selecting the resource with the highest probability of containing the desired information can decrease the time requirement and increase the accuracy of the response.**

★ **Otherwise, unnecessary time and energy may be expended on searching references unable to produce the needed facts.**

مفاهيم الأساسية حقك الـ References قسمهم لقسمين .. ① الـ① أنواع من علاج ② الـ Literature كلاتها ح
↳ Primary — Secondary — Tertiary ⇐ بالتفصيل لاحقاً سنشرح later on

وكأي الـ .. Literature أني تشرح الـ pharmacist على يرجع للـ Primary
الـ يرجع لم Original ؟ قبل يرجع للـ Secondary ⇒ للـ up to date publications
publications .. ؟ Tertiary ومنها هو textbook ؟ ..
الكلام الـ pharmacist تقسيم أنه سألت عن الـ references حسب الأولوية يعني...
إذا الـ patient سألني عن معلومات عن الـ Amoxicillin ... يجب أن أعرف
أن يجب أن أعود في البداية إلى الـ Tertiary ومنها الـ Textbook اللي تشتغل
Reference
عن الـ dose .. وبالتالي الـ pharmacist لا يجب أن يستخدم أسهل طريقة للحصول
على معلومات دقيقة وصحيحة .. يجب أن يستخدم الـ reference الـ أو الكتب أن يحصل على دقة

Categorize the question

In the previous example above, the amoxicillin request pertains to a dose.

Therefore, this question would be classified as Dose.

- **The following are examples of references that provide this information:** American Hospital Formulary Service (AHFS), Facts and Comparisons, and USP Drug Information (USPDI) for the Health Care Professional.

وبالتالي مثلاً هنا لدينا References الحصول على معلومة وهي معينة 6 References ظهر .. جوّد من الـ References ... dose الـ Amoxicillin of the dose

❖ **Textbooks specific for drug interactions:**
Drug Interaction Facts and Hansten and Horn's Drug Interactions Analysis and Management.

هذا Textbooks موجودة عن خاصة بـ Drug-Drug interactions

- Therefore, if the inquiry concerned the potential of concomitant administration of warfarin (Coumadin®) and aspirin to increase the International Normalized Ratio (INR), the question would be classified as a Drug Interaction and a logical starting point would be these two references.

4. Develop Strategy and Conduct Research

1. Select and prioritize resources based on the probability of locating the desired information.

- Without prioritization, resources may be used based on ease of access or degree of comfort instead of probable efficiency.

4. Develop Strategy and Conduct Research

2. Conduct a systematic search

- Be familiar with the three types of information sources in the literature hierarchy.

- Begin with the established knowledge located within the tertiary literature (e.g., textbooks) due to the condensed, easy-to-use format of the information presented.

4. Develop Strategy and Conduct Research

2. Conduct a systematic search

- Progress through the secondary literature (e.g., MEDLINE, International Pharmaceutical Abstracts [IPA]) to the primary literature (e.g., controlled clinical trails, letters to the editor).

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4. (Develop Strategy and Conduct research)

يجب أولاً نقوم بعمل اشياء Prioritize نبدأ أولاً resource اللي فيها resource نبدأ "textbooks" وفي tertiary literature

نقوم Confirm المعلومات الموجودة نروح Tertiary literature نقوم Secondary literature

↳ And then to the primary literature

نقوم بأخذ المعلومات من الـ Secondary الـ primary وفي الـ up to date information

نبدأ هذا نقوم بتقسيم Secondary literature على عنده Publications نقوم بعمل مستوى وتنظيم

... further of all نبدأ بأخذ المعلومات كلها وتقديم وتوضيح يجب up to date information

And then we can return back to the Secondary Literature to Confirm these information ← Tertiary Literature

• Example:

Continuing with the dose of amoxicillin prior to dental procedures for bacterial endocarditis prophylaxis, the question was classified as a Dose question. Therefore, references most likely to contain the dose of amoxicillin (e.g., American Hospital Formulary Service [AHFS], Facts and Comparisons, and USP Drug Information [USPDI] for the Health Care Professional) were consulted first. However, after reviewing these references a discrepancy in the recommended dose was identified in the references. Two of the references reported the amoxicillin dose as 2 grams orally one hour prior to the dental procedure and the other reference reported the dose as 3 grams one hour prior to the procedure and 1.5 grams 6 hours after the first dose.

Example ـــ٥

Patient الاول لدينا عندو background عن معلومات عندو Dose of Amoxicillin قد يطلب طلب دوز يأتي requester الاول

يسأل عن dose الـ amoxicillin كـ ١٨ سنة ذكر ٨ سنة Male of dental procedures as ان يأخذ طلب
for bacterial   dental procedures as
Endocarditis   a prophylaxis

نطلع الـ Pharmacist علاج references رح يدور two references الدوريات لدينا
dose of Amoxicillin الاطباء ان يعطي ٩٠٪ Amoxicillin dose الـ
Amoxicillin dose تنزل تقول reference يعطينا references معلومات مختلفة لدينا الـ
reported → other reference الـ.. dental نص dose 2 grams Orally يقول ان
the dose as 3 grams one hour → procedure   Procedure طلب
1.5 grams 6 hours after the first dose ٤-٩ grams

FOGG

Subject............................ Day.................... Date..............

two different علاج references الـ عن علاج pharmacist الـ اكد قال
information

ماذا يفعل الـ Pharmacist ؟
يا ترى اب أي نوع الـ tertiary الدوريات ان يعطي
.Textbooks والـ literature

- Due to this discrepancy, internal medicine and infections disease textbooks were consulted; these texts further supported the dose of amoxicillin as 3 grams one hour prior to the procedure and 1.5 grams 6 hours after the first dose.

amoxicillin الـ dose يوجد فرق موجود بين الـ textbooks الـ pharmacist الـ
1.5 grams 6 hours و procedure الـ قبل 3 grams one hour في
after the first dose

قد يكون الطبيب في حيرة من أمره في موضوع الـ Tertiary الـ textbooks قد تكون شكلي
textbook الـ ادا يكون ان شي يعني يكون شكل خطأ (مش)
قد يكون الطبيب معتمد في علاجي خلال آلية الـ سنتين على كتاب

fico

Secondary up to date Publication يمكن ان يكون الـ Pharmacist قد يكون شكلي
Literature
Confirm الازم اعادة المعلومة من خلال الـ موقع حق Secondary
Literature
new guidlines الـ up to date حتى
for bacterial endocarditis
prophylaxis
before dental procedure

- To insure that the most up-to-date information was obtained, a secondary literature search was conducted (e.g., MEDLINE, Iowa Drug Information Service [IDIS], and International Pharmaceutical Abstracts [IPA]) and an article with updated guidelines for bacterial endocarditis prophylaxis was located.

- The new guidelines recommend amoxicillin 2 grams orally one hour prior to the dental procedure for bacterial endocarditis prophylaxis; a second dose is not required.

- As mentioned previously, if the question is classified as a Drug Interaction, then a logical and efficient search would begin with a text specific for drug interactions (e.g., Hansten and Horn's Drug Interactions Analysis and Management, Drug Interaction Facts and Comparisons).

عن طبيب ما بيرجع الرجوع الى new Guidlines وبقول وجود الـ (Pharmacist
امين يجب ان يعطي amoxicillin الـ one hour Orally 2 grams Should be
مع الـ dental procedure
As a bacterial endocarditis prophylaxis

مهم كثير عندنا الـ Steps الـ ١٠٠ Steps لأنو الـ Steps أول Step الـ Pharmacist
يجب أن ياخذ background information من الـ patients بشكل عام ومع الملاحظات
الاكثر اهمية يجب أن يكون لديه (Good listening & questioning) Communication Skills

Third Step ان يقوم الـ Pharmacist بعمل تقييم على المعلومات الـ third literature
ومع الـ tertiary literature وفي الـ textbooks يقدر Confirm وتقييم
ومن تأتي انواع الـ Secondary literature _ up to date information

FOGG

- If a text specific for drug interaction is not available, other references likely to contain the desired information (e.g., Drug Facts and Comparisons, American Hospital Formulary Service, Micromedex) should be selected as opposed to references with a decreased probability of containing the information (e.g., Drug Topics Red Book, American Drug Index).

5. Data Evaluation, Analysis, Synthesis

Confirm information with other references to assure consistency between various resources while authors, editors, and publishers attempt to assure the reliability of the information published, most resources include a disclaimer statement since errors do occur occasionally.

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5. Data evaluation, Analysis, Synthesis

نتصور اذا كان ال Pharmacist عندة معلومات حديثة من ال literature
عن about the dose of amoxicillin مثلا اجا ال patient عندة bacterial endocarditis prophylaxis
مثلا dental procedure محتاج dose معينة، اخذ information up to date
الان ال Pharmacist على طول يروح evaluation يعني يروح data على طول يؤكد confirm
يأخذ information على طول يؤكد confirm؟ لأ... يروح يأكد، يؤكد على ال
publication او resources يؤكد فيها ال disclaimer مثل ان ال
المؤلف والناشر ... في ال كتاب او ... مهما يصحح ... لا وأكثر الكتب (
اخطاء.

6. Formulate and Provide Response

1. Restate the question and any pertinent background information.

2. This allows the requestor to be informed of the question and focused on the impending response.

3. Provide the information and recommendation (if applicable).

6. Formulate and provide response

النقطة رقم 6 إلى مهمة الـ Pharmacist فيها تقدم معلومات مناسبة ويقدم response

نستخدم الـ response المقدمة إلى الـ requester .. القضية requested أقرأ الـ

response الي نقدمها كي نخلي الـ Pharmacist الـ requester يستنى

على . educational level of the Requester

- In addition, a brief review of the search strategy and references reviewed may be included in the response as a confirmation to the comprehensive search conducted.

- Compose the response at the requestor's comprehension level.

7. Follow Up and Follow Through

★ Verify the appropriateness, correctness, and completeness of a response.

★ Essential when judgement calls used.

★ Essential when new data found or circumstances changed from original request.

★ Document everything!

7. Follow up and ~~through~~ Follow through

الي آخره يعني بعد ما نعطي الطبيب او المريض follow up الحالة تبع الـ As a pharmacist
اذا الوقت تحسن او تغيّر معناتها بيرجع requester الـ طالب المعلومة او physician

تصير up to date information .. زيادة information معناها الـ requester يعني طالب الحالة تصير أصبح لديه
information

او بالتالي .. أحدث معلومة و اجدد يعني أكثر ايضاً disease يعني قد لها تغيّر المرض الـ Change

تقدر تقول انه يتغير وظيفة و معناها to follow up معناها

.Follow up معناها الـ follow up

FOGG

Ethical and Moral Responsibility

★ How will they use your information?
★ Are they asking for lethal dose of drug?
★ Are they suicidal or homicidal?
★ Are they seeking information for making illicit drugs?
★ Are they trying to forge a prescription?
★ Are they in serious need of an ER?

Ethical and Moral responsibility

نتكلم عن الـ Some responsibility لـ) Requester الـ providing response

وقت الـ ممكن كـ شخص نكون 9 ... كذا؟! Ethical & Moral responsibility

لما كـ شخص نكون Should be documented عشان تثبت حقائق معلومات الـ pharmacist الـ

requester و الـ معلومات 5 Should be documented responsibility الـ حتى لو أخذ عليك حق

معلومات الـ patient يكون نكون واجبي ما نسوي الـ ول عليك دحيث معلومات كذا يحب Pharmacist

هل .. عند أكثر من الدواء الذي يسأل requester 65 الدواء

سؤال لو ان أخذ ينتمي معلومات عن ساعة معينة عن الدواء؟

يطلب كذا نتكلم عن ان ينتمي معينة lethal dose of drug

في الوقت الحالي ، معلومات جرعات حجات و مواد لل Emergency department

هل ساعاتي نعطي معلومات لكل شخص ... وكذا وكذا و كذا؟

كـ ان نكون responsibility لها as a pharmacist .. Ethical & legal respon responsibility

لما ان الـ patient أو كذا الـ requester يسأل اذا ساعة هم الاساس؟ -...

نكون واجبي عليا السؤال اذا سألني هاي أو كذا ولما اساني هاي أو الدواء؟

لا ان كـ شخص ما يكون ... كلها Documented .

Methods of documentation

معنى طرق الـ Documentation

- Paper form
- Logbook
- Computer database

Reasons for documentations

1. Justification of pharmacist's professional value to the institution.

2. Future reference for repetitive drug information requests.

3. Protective measure against legal liability.

① أنه حتى نعزز دورنا كصيادلة في ـ

② أنه يأتي مثلا نفس الـ Case ~ for another patient أي هي لا تتشترك ←

Methods of follow-up

- Mail survey
- Phone call
- Written communication

Reasons for follow-up

ماذا اذا ان الـ follow up موجود؟ 🔽

1. Provide the requestor with additional information that supports or changes a prior recommendation.

2. Obtain feedback concerning the quality of the service.

Example

A prescriber inquires about the relationship between elevated homocysteine levels and coronary heart disease (CHD). Furthermore, the caller requests information concerning prescribing folic acid to decrease homocysteine levels. After following the modified systematic approach, evidence that documented a relationship between elevated homocysteine levels and CHD was located. In addition, preliminary therapeutic trial information supported daily supplementation of folic acid to lower homocysteine levels. A few weeks later, additional information that further established the efficacy of folic acid in lowering homocysteine levels was published. Follow-up should be provided to the prescriber due to the recent information affirming the prior response.

الكثير من النعم منحها الله لك دون أن تسأله
فكيف إذا سألته ؟؟

Thank You