

## DRUG PRESCRIBING PATTERNS IN DENTAL TEACHING HOSPITALS

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### ABSTRACT

*Medicines are prescribed in the dental setting for a number of reasons, like oral infections, inflammations, pain complaints, fractures, cancers etc. Medications prescribed are of various kinds mainly antibiotics, anti-inflammatory, and analgesics.*

*The aim of this study was to observe drug prescribing trends i.e. the number of drugs and antibiotics prescribed per prescription, presence of any drug-drug interaction or adverse drug reactions if any and preference of brand or generic name prescribing, in both government and private dental teaching hospitals of Lahore.*

*An observational and questionnaire based retrospective study was conducted for this purpose. 80 patients were selected randomly for their prescription analysis, 40 from each hospital (private and government). 20 dentists were also selected for their preferences in prescribing medicines to dental patients.*

*Irrational prescribing was observed more in government setting than in the private hospital. Antibiotics prescribing ratio was more in government hospitals, drug-drug interactions were also observed there that were not present in private hospital. Amoxicillin was prescribed 60% in government, and 77% in private dental setting. 94% of subjects were given 2 antibiotics per prescription in government setting as compared to 4% in private setting. Generic prescribing was not observed in both government as well as in private hospitals.*

*Conclusively, much attention must be given to government hospitals as irrational prescribing has been observed more there. The irrational use of antibiotics must be corrected. Emphasis should be given on generic prescribing to reduce and to avoid the overlapping of inventory.*

**Key Words:** Drug prescribing pattern, dental teaching hospitals.

### INTRODUCTION

Medicines have an important role in health care system, as they provide the patients with disease treatment and prevention. For the effective provision of health care, medicines should be of good quality and affordable too.<sup>1</sup>

Rational prescribing is the process in which patients receive medications according to their clinical needs, in

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such doses that are according to individual requirements for a time period that is adequate for each individual, and cost must be as low as possible for the individuals and for the community as well.<sup>2</sup>

As per WHO, irrational or non-rational use is the use of medicines in a way that is not compliant with rational use as defined above. It was reported that worldwide, 50% of the patients do not take medications properly while 50% of all the medications are prescribed, dispensed or sold irrationally. About one-third of the world's population lacks access to essential medicines.<sup>3</sup>

Irrational use of drugs is the increasing problem in medical practice which is leading to many consequences like drug resistance to antibiotics, ineffective treatment, adverse effects, and increased cost for the patients and the community. Despite of the several programs on rational use of medicines, irrational prescribing still persists.

Despite of various specific programs on rational use of drugs by many national and international agencies but irrational prescribing still is a common practice. Drug combinations, counterfeit medications, spurious medicines, banned lifestyle drugs, and withdrawn drugs are being prescribed irrationally.<sup>4</sup>

In a dental setting, drugs are prescribed by the dentists either for the treatment or for the prevention of a certain dental condition. Several kinds of the medicines are prescribed for dental conditions like antibiotics, antiseptics and NSAID's. Indications for the use of systemic antibiotics in dentistry are limited, since most dental and periodontal diseases are best managed by operative intervention and oral hygiene measures. However, there are evidences of irrational prescribing practices by dentists in the literature, reasons may be inadequate knowledge and social factor.<sup>5</sup> Irrational prescribing may include overuse of drugs and injections, Multi-drug use or poly pharmacy i.e the number of drugs per prescription is often more than needed, with an average of 2.4 up to ten drugs.<sup>3</sup>

According to a research conducted in India, most commonly prescribed drugs by dental surgeons were antiseptics (49.8%), NSAIDs (23.2%), antibiotics (32.6%) and Vitamins (3.6%). The number of drugs per prescription was four on an average, the average number of antibiotics was two per prescription, and number of drugs prescribed by Generic Name was only four. The incidence of drugs prescribed by the generic names and from the essential drug list was low.<sup>4</sup>

Studies suggest that it is necessary to make dental physicians aware about the value of generic prescribing and its effect on patient and the use of drugs from essential medicine lists along with the factor of cost-effectiveness for patients. Also, there is a clear need to promote the rational and appropriate drug use through establishment of prescribing guidelines and certain educational initiatives.<sup>4</sup>

Aims and objectives were to study the drug prescribing patterns in dental teaching hospitals of Lahore, and to observe the number of drugs per prescription, number of antibiotics per prescription, number of drugs prescribed by generic names, and presence of drug-drug interactions.

## STUDY DESIGN

An observational and questionnaire survey was conducted about the prescribing patterns among the dental patients receiving treatment in dental hospitals of Lahore i.e. Punjab Dental Hospital, Fatima Memorial Hospital, Lahore medical and dental college, Lahore.

STUDY TYPE: Retrospective study

SAMPLING TECHNIQUE: Random sampling

STUDY PLACE: Punjab Dental Hospital, Lahore

Fatima Memorial Hospital, Lahore

Lahore Medical and Dental College

SAMPLE SIZE: 100

INCLUSION CRITERIA: Dental patients referred for root canal treatment, extraction, scalling and minor surgery

EXCLUSION CRITERIA: Dental patients referred for periodontal treatment

DURATION OF STUDY: 2 months. It was conducted from July 2015 to September 2015

PLAN OF WORK: A data collection form was designed and filled by direct interviewing with the patients and health care providers (dentists, pharmacists). Data were presented in tabulated form along with the figures.

## RESULTS

In private hospitals, mostly 2 drugs were being prescribed per prescription i.e 27%, 19% of the data accounted for 1 drug per prescription. Prescribing 3 and 4 drugs per prescription was not common i.e 3% and 1% respectively. While in the government hospital, mostly 3 drugs were given per prescription i.e 62%.<sup>1</sup> drug per prescription was only 4% of the collected data, 16% of the data accounted for 2 drugs per prescription and prescribing of 5 drugs per prescription was not common i.e 2% and 16% of data accounted for 4 drugs per prescription.

50% of the cases were so observed in the private hospitals, in which no antibiotic was prescribed, 2 antibiotics/ prescription accounted for 46% of the results and 1 per prescription accounted for 4%. 97% of the prescriptions contained one painkiller per prescription in government hospital, and 95% in private hospital.

All the medicines were prescribed by their brand names in all hospitals. The most commonly used antibiotic in government hospital was amoxicillin (60%), along with metronidazole (40%), while in private hospitals, the most commonly prescribed antibiotic was amoxicillin (77%) and levofloxacin (22%). 50% of the painkillers prescribed in private setting were Synflex, 25% Decloren, and Panadol 22%. While in government setting, 13% of the prescribed painkillers were synflex, 25% Voren, 20% Decloren, 13% Sanid, and 8% Panadol. (Tables 1-12 and Figs 1-6)

## DISCUSSION

Dentistry deals with the evaluation, diagnosis, prevention and/or treatment (nonsurgical, surgical or related procedures) of diseases, disorders and/or conditions of the oral cavity, maxillofacial area and/or the adjacent and associated structures and their impact

TABLE 1: AWARENESS ABOUT ORAL HYGIENE: N=100

Yes	No	Little awareness
46%	16%	38%

TABLE 2: PREFERENCE OF HOME REMEDIES OR SELF-MEDICATIONS N=100

Home remedies	Self-medication	Dentist's medication
13%	9%	78%

TABLE 3: AWARENESS/INFORMATION ABOUT THE MEDICATIONS GIVEN TO PATIENTS BY THEIR DENTIST N=100

Yes	No	Little information
81 %	3 %	16 %

TABLE 4: NUMBER OF THE DRUGS PER PRESCRIPTION N=100

Hospitals	Number of drugs per prescription				
	1/pre-prescription	2/pre-prescription	3/pre-prescription	4/pre-prescription	5/pre-prescription
Private Hospital	19%	27%	3%	1%	0%
Government Hospital	4%	16%	62%	16%	2%

TABLE 5: NUMBER OF THE ANTIBIOTICS PER PRESCRIPTION N=100

Hospitals	Number of antibiotics per prescription		
	0 /pre-prescription	1 /pre-prescription	2/pre-prescription
Private Hospital	50%	46%	4%
Government Hospital	0	6%	94%

TABLE 6: NUMBER OF PAINKILLER PER PRESCRIPTION

Hospitals	Number of painkiller per prescription	
	1 per prescription	2 per prescription
Private Hospital	95%	5%
Government Hospital	97%	3%

TABLE 7: GENERIC/TRADE NAME PRESCRIBING N=100

Hospitals	Generic prescribing	Trade name prescribing
Private Hospitals	0	100%
Government Hospital	0	100%

TABLE 8: DRUG-DRUG INTERACTIONS OBSERVED OR NOT N=100

Hospitals	Drug-Drug Interactions	
	Yes	No
Private Hospital	0	100%
Government Hospital	4%	96%

TABLE 9: COMMON ROUTE OF ADMINISTRATION OF DRUGS

Hospitals	Common route of drug administration		
	Oral route	Intra-venous route	Intra-muscular route
Private Hospitals	60%	40%	0%
Government Hospital	48%	50%	2%

TABLE 10: COMMONLY PRESCRIBED ANTIBIOTICS N=100

Hospitals	Commonly prescribed antibiotics			
	Amoxicillin	Levofloxacin	Metro-nidazole	Cefadroxil
Private Hospitals	77%	22%	0	0
Government Hospital	60%	0	40%	0

TABLE 11: COMMONLY PRESCRIBED PAIN KILLER

Hospitals	Commonly prescribed pain killers					
	Syn-flex	Vo-ren	Declo-ren	Bru-fen	Pana-dol	San-id
Private Hospital	50%	0%	25%	3%	22%	0%
Government Hospital	13%	25%	20%	20%	8%	13%

TABLE 12: PATIENT COUNSELING OBSERVED N=100

Hospital name	Patient counseling present	Patient counseling absent
Fatima Memorial Hospital	100%	0%
Punjab Dental Hospital	100%	0%

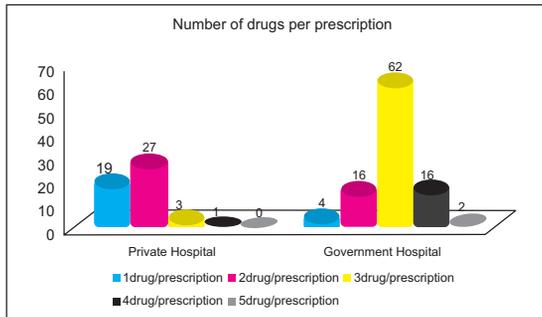


Fig 1: Number of drugs per prescription

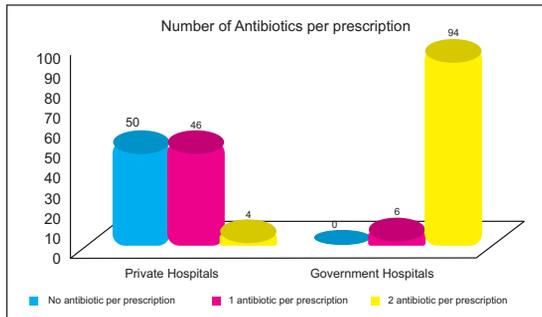


Fig 2: Number of Antibiotics per prescription

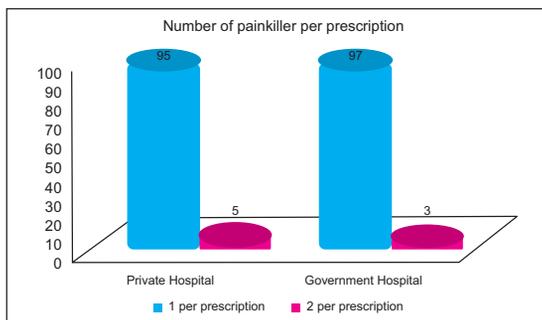


Fig 3: Number of Painkiller per prescription

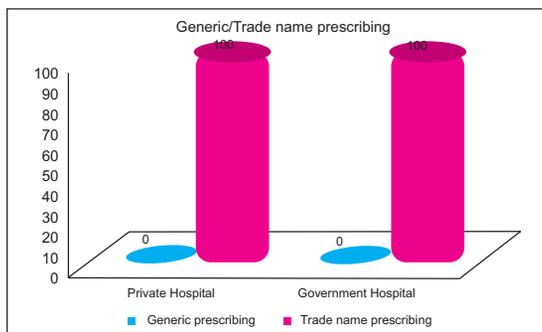


Fig 4: Generic/Trade name prescribing

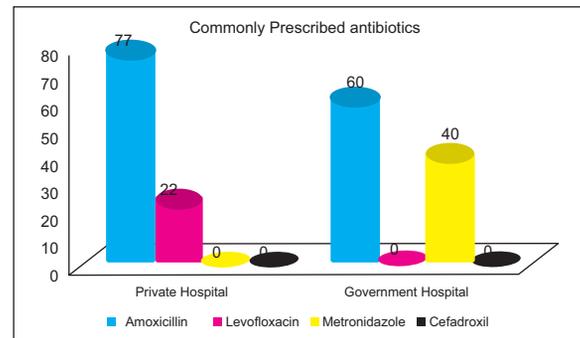


Fig 5: Commonly prescribed antibiotics

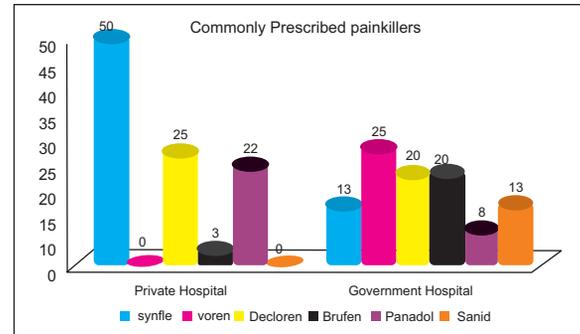


Fig 6: Commonly Prescribed Painkillers

on the human body; provided by a dentist, within the scope of his/her education, training and experience, in accordance with the ethics of the profession and applicable law. (Adopted, American Dental Association House of Delegates, 10/21/97).

There are a number of different drugs dentists may prescribe depending on the condition. Some medications are prescribed to fight certain oral diseases, to prevent or treat infections, or to control pain and relieve anxiety. Dentists prescribe medications for the management of a number of oral conditions, mainly orofacial infections. Since most human orofacial infections originate from odontogenic infections, prescribing antibiotics by dental practitioners has become an important aspect of dental practice. For this reason, antibiotics account for the vast majority of medicines prescribed by dentists.

Prescribing trends were observed in government and private teaching dental hospitals. Use of antibiotics was more in government hospitals i.e 2 antibiotics per prescription. Such increased use of antibiotics may cause resistance day by day. Drug-drug interactions were also observed in the government hospital but were not reported in the private sector. Most common prescribed antibiotics were amoxicillin and metronidazole 60% and 40% respectively in government hospital. In the private setting, ratio was 77% amoxicillin and 23% levofloxacin. 70% of the drugs prescribed accounted unnecessary in the government hospital that is indicated by the more use of antibiotics and pain killers.

Medicines were being administered 60% orally and 40% intravenously in the private hospitals, and 48% orally, 50% intravenously, 2% intramuscularly in government hospital. Patient counseling was observed in both government and private hospitals but was more satisfactory in private setting which may be because of the high number of patients visiting government hospitals, lack of environment required for effective counseling.

Medications were being prescribed by their Trade names rather than the generic names in hospitals, government and private that may leads to poly-pharmacy. In previous studies, Poly-pharmacy was observed as the number of drugs prescribed per prescription was four leading to the drug interactions, adverse drug reactions and increase health care cost. This trend has been seen reducing in private hospitals as number of drugs per prescription is now two with no or low number of antibiotics in dental setting. However the government hospitals still following the old trend with more than 2 number of antibiotics.

As compared to previous studies done on prescription analysis there is a clear need for the development of prescribing guidelines and educational initiatives to encourage the rational and appropriate use of drugs in dentistry. It was found that percentage of drugs prescribed by generic name was significantly low and is not based on WHO criteria for rational use of drug. It is thus necessary to make dental physicians aware about the use of drugs by their generic name and from patient's point of view the factor of cost effectiveness.

## CONCLUSION

The study concluded that the prescribing practices are not satisfactory in the governmental hospital, as indicated by the more number of drugs per prescriptions, overuse of antibiotics, drug-drug interactions, and patient counseling not satisfactory. The average numbers of antibiotics were 2 per prescription whereas it was 1 or no antibiotic on average in private hospital. No adverse drug reaction was reported in both dental settings. Medicines were prescribed by their trade names in both, private and dental hospitals. Patient counseling was observed in both hospitals, but more effective in private hospital.

## RECOMMENDATIONS

- Certain guidelines must be established to avoid increasing use of antibiotics.
- Employing a pharmacist to avoid poly-pharmacy, drug interaction etc.
- Awareness programs and campaigns must be run especially in the government sector hospitals, to focus on the risks associated with over prescriptions of antibiotics.

- Rules and policies must be made to enhance prescribing of medicines with the generic names.

## REFERENCES

- 1 Ehijie FO. Enato and Ifeanyi E. Chima, Evaluation of drug utilization patterns and patient care practices. *West African Journal of Pharmacy*, 22 (1): 36-41, (2011). (DOR 5-5-2015)
- 2 WHO conference of experts Nairobi 1985 (DOR 5-5-2015)
- 3 <https://ispub.com/IJPHARM/10/1/14081> (DOR 5-5-2015)
- 4 [http://www.academia.edu/179362/Drug\\_Prescribing\\_Pattern\\_in\\_Dental\\_Teaching\\_Hospital](http://www.academia.edu/179362/Drug_Prescribing_Pattern_in_Dental_Teaching_Hospital) (DOR 5-5-2015)
- 5 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2909496/> (DOR 5-5-2015)
- 6 <http://apps.who.int/medicinedocs/pdf/whozip23e/whozip23e.pdf> (DOR 18-04-2015)
- 7 [https://www.google.com.pk/?gws\\_rd=cr,ssl&ei=XSAyVYK-mAaf4ywP41YD4C\\_g#q=definition+of+prescribing](https://www.google.com.pk/?gws_rd=cr,ssl&ei=XSAyVYK-mAaf4ywP41YD4C_g#q=definition+of+prescribing) (DOR 18-04-2015)
- 8 Rational prescribing: the principles of drug selection: Simon Maxwell, doi: 10.7861/clinmedicine.9-5-481 *Clin Med* October 1, 2009 vol. 9 no. 5 481-485 (DOR 19-04-2015)
- 9 Rational prescribing, appropriate prescribing: J K Aronson, *Br J Clin Pharmacol*. 2004 Mar; 57(3): 229-230. doi: 10.1111/j.1365-2125.2004.02090. (DOR 18-04-2015)
- 10 <http://www.rationalprescribing.com/home.html> (DOR 19-04-2015)
- 11 <http://apps.who.int/medicinedocs/en/d/Jwhozip23e/3.1.2.html> (DOR 19-04-2015)
- 12 <http://www.gpnotebook.co.uk/simplepage.cfm?ID=1362427972> (DOR 19-04-2015)
- 13 <http://www.slideshare.net/Mohammad-Hadi-Farjoo/rational-prescribing-prescription-writing> (DOR 18-04-2015)
- 14 <http://apps.who.int/medicinedocs/en/d/Js2281e/2.html> (DOR 18-04-2015)
- 15 Analysis of clinical records of dental patients attending Jordan University Hospital: Documentation of drug prescriptions and local anesthetic injections: Najla Dar-Odeh, Soukaina Ryalat, Mohammad Shayyab, and Osama Abu-Hammad, *Ther Clin Risk Manag*. 2008 Oct; 4(5): 1111-1117. Published online 2008 Oct. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2621415/> (DOR 18-04-2015)
- 16 Bugs, Drugs, Pain and Anxiety: Considerations for Proper Prescriptions in Today's Dental Practice, Allison M. DiMatteo, BA, MPS, Available at: [www.dentalaegis.com](http://www.dentalaegis.com) (DOR 19-04-2015)
- 17 [http://www.fgdp.org.uk/\\_assets/pdf/publications/pdj/fgdp%20pdj%20nov14%20p44-47.pdf](http://www.fgdp.org.uk/_assets/pdf/publications/pdj/fgdp%20pdj%20nov14%20p44-47.pdf) (DOR 19-04-2015)
- 18 [http://www.jaypeejournals.com/eJournals/ShowText.aspx?ID=1607&Type=PAID&TYP=TOP&IN=\\_eJournals/images/JPLOGO.gif&IID=142&isPDF=YES](http://www.jaypeejournals.com/eJournals/ShowText.aspx?ID=1607&Type=PAID&TYP=TOP&IN=_eJournals/images/JPLOGO.gif&IID=142&isPDF=YES) (DOR 18-04-2015)
- 19 <http://www.scopemed.org/?mno=33842> (DOR 19-04-2015)
- 20 Diagnosis and prescribing pattern of antibiotics and painkillers among dentists.: Tanwir F, Marrone G, Tariq A, Lundborg CS., *Oral Health Prev Dent*. 2015;13(1):75-83. doi: 10.3290/j.ohpd.a32341. (DOR 19-04-2015)
- 21 Analgesic prescription pattern in the management of dental pain among dentists in İstanbul: Sinan Şermet\*, Müşerref Asuman Akgün\*, Şükran Atamer-Şimşek\*<http://e-dergi.marmara.edu>

- tr/marupj/article/viewFile/5000010578/5000010537 (DOR 19-04-2015)
- 22 A Statewide Evaluation of Opioid Prescribing Patterns with an Emphasis on Drug Diversion and Substance Abuse: Dr. Michael O'Neil. (DOR 19-04-2015)
- 23 Knowledge and attitudes of pharmacists regarding oral health care and oral hygiene products in Chennai city: Shanmuga Priya, PD Madan Kumar, S Ramachandran, Year: 2008, Volume: 19, Issue: 2, Page: 104-108  
Available at: <http://www.ijdr.in/article.asp?issn=0970-9290;year=2008;volume=19;issue=2;spage=104;epage=108;au-last=Priya> (DOR 18-04-2015)
- 24 Enhancing pharmacists' role as oral health advisors: Leonard A. Cohen, J Am Pharm Assoc (2003) 2013;53:316-321. doi:10.1331/JAPhA.2013.12017 (DOR 19-04-2015)
- 25 <http://healthylivingmadesimple.com/a-pharmacists-role-in-oral-health/> (DOR 18-04-2015)
- 26 Antibiotic prescribing by general dental practitioners in the Greater Glasgow Health Board, Scotland: K M Roy & J Bagg, British Dental Journal 188, 674 - 676 (2000). Published online: 24 June 2000 | doi:10.1038/sj.bdj.480057 (DOR 19-04-2015)
- 27 An evaluation of the role played by community pharmacies in oral healthcare situated in a primary care trust in the north of England: P E V Maunder & D P Landes, British Dental Journal 199, 219 - 223 (2005) Published online: 27 August 2005 | doi:10.1038/sj.bdj.4812614 (DOR 19-04-2015)
- 28 <http://www.app.dundee.ac.uk/tuith/Static/info/warfarin.pdf> (DOR 19-04-2015)
- 29 Location of community pharmacies and prevalence of oral conditions in the Western Cape Province: Feroza Amien, Neil G. Myburgh, Nadine Butler, Health SA Gesondheid 10/2013; 18(1):1-9. DOI: 10.4102/hsag.v18i1.68 (DOR 19-04-2015)
- 30 A comparison of antibiotic prescription by doctors and dentists for acute dental conditions: N Palmer, British Dental Journal 188, 386 (2000). Published online: 8 April 2000 | doi:10.1038/sj.bdj.4800490 (DOR 19-04-2015)
- 31 A review of use of antibiotics in dentistry and recommendations for rational antibiotic usage by dentists: Dr. Akilesh Ramasamy, the international Arabic journal of antimicrobial agents 2014, Vol. 4 No. 2:1doi: 10.3823/748. (DOR 19-04-2015)
- 32 Antibiotic prescribing knowledge of National Health Service general dental practitioners in England and Scotland: N. O. A. Palmera, M. V. Martina, R. Pealinga, R. S. Irelanda, K. Royb, A. Smithb and J. Baggb, J. Antimicrob. Chemother. (2001) 47 (2): 233-237. doi: 10.1093/jac/47.2.233 (DOR 19-04-2015)
- 33 Antibiotic prescribing practices by dentists: a review, Najla Saeed Dar-Odeh, Osama Abdalla Abu-Hammad, Mahmoud Khaled Al-Omiri, Ameen Sameh Khraisat, and Asem Ata Shehabi Ther Clin Risk Manag. 2010; 6: 301-306.  
Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2909496/> (DOR 2-09-2015)
- 34 <http://www.webmd.com/oral-health/medications-used-dentistry> (DOR 2-09-2015)
- 35 An analysis of antibiotic prescriptions from general dental practitioners in England, Nikolaus O. A. Palmer, Michael V. Martin, Rosemary Pealing and Robert S. Ireland. J. Antimicrob. Chemother. (2000) 46 (6): 1033-1035. doi: 10.1093/jac/46.6.1033 (DOR 2-09-2015)

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