

## Factors influencing use of analgesics among construction workers in the Ga-East municipality of the Greater Accra region, Ghana

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### SUMMARY

**BACKGROUND:** Analgesics also known as painkillers are widely used for pain relief. There are severe health implications associated with excessive use of analgesics. This paper examines factors influencing the use of analgesics among construction workers in the Ga-East Municipality (GEM) of the Greater Accra region of Ghana.

**METHODS:** This is a cross-sectional study involving 206 construction workers randomly sampled from 7 construction sites in the GEM. A structured questionnaire was used to elicit responses on knowledge of analgesics, types of analgesics used and factors influencing the use of analgesics. Chi-square test analysis was used to examine factors influencing analgesic use.

**RESULTS:** The majority of workers were aged between 15 to 44 years (89.8%) and 51.9 percent of respondents had completed Junior high school. Many respondents (68.0%) used Brand 1 a locally manufactured analgesic with paracetamol, aspirin and caffeine as the active ingredients and 31.6 percent of respondents had no knowledge of possible side effects of continuous use of analgesics. Chi square analysis showed that age was significantly associated with use of analgesics ( $p < 0.01$ ). Knowledge of the types of analgesics, dosage and side effects did not influence use ( $p > 0.05$ ). Television and radio advertisements influenced use of analgesics ( $p < 0.01$ ).

**CONCLUSION:** Knowledge on analgesic use and knowledge of probable serious side effects was inadequate. Pharmacists and chemists involvement in education of clients of the side effects of analgesics is highly recommended to minimise misuse. The Food and Drugs Authority should regulate the proliferation of advertisements for analgesics in the media.

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**Keywords:** analgesics, NSAIDs, construction workers, over-the-counter drugs, OTC

### INTRODUCTION

Analgesics also known as painkillers are widely used for pain relief. Analgesics could be opioid (narcotic) or non-opioid (non-narcotic). Opioid analgesics are derived from opium and are used for the management of mild to severe pain. They include morphine, codeine and tramadol.<sup>1</sup> Non-opioid analgesics are a diverse group of drugs that are commonly used for headaches, the relief of mild to moderate pain and the treatment of fever and flu because they have pain relieving antipyretic, and anti-inflammatory properties.

Non-opioid analgesics include non-steroidal inflammatory drugs (NSAIDs). The family of NSAIDs includes aspirin, ibuprofen and diclofenac<sup>2-4</sup> which are easily obtained over the counter (OTC).

Paracetamol (acetaminophen) which is also a common OTC drug is not classified as an NSAID because it has relatively little anti-inflammatory activity, unlike aspirin and ibuprofen.<sup>5</sup>

The medicines regulatory authority in Ghana is the Food and Drugs Authority (FDA), formerly known as the Food and Drugs Board. The FDA was established in 1997 under the Food and Drugs Law, 1992 (PNDC 305B). The FDA is mandated by the public health act 2012 (Act 851) to regulate food, drugs, food supplements, herbal and homeopathic medicines, veterinary medicines, cosmetics, medical devices, household chemical substances, tobacco and tobacco products.<sup>6</sup>

The functions of the FDA include marketing, authorisation and registration, inspection, import control, market control, quality control, clinical trials control, medicines advertising and promotion, and pharmacovigilance.<sup>7</sup> The Ghana Pharmacy Council (GPC) was established by an act of Parliament in 1994, (Act 489). It is a statutory regulatory body that seeks to secure the highest level of pharmaceutical care by ensuring that competent pharmaceutical care providers deliver services within agreed standards. Additionally, the GPC collaborates with related local agencies and international pharmaceutical organisations to enhance the effectiveness of rational drug use in the country.<sup>8</sup>

In Ghana, medicines are categorised into prescription only, OTC and pharmacist prescribed. This study focuses on analgesics which are OTC. Analgesics that are classified as OTC do not necessarily require a prescription and therefore they are widely used all over the world as pain relievers and for the treatment of mild fever spells. Studies from the United States of America (USA)<sup>9</sup> Canada<sup>10</sup>, Portugal<sup>11</sup>, Denmark<sup>12</sup> and Australia<sup>13</sup> suggest an increased use of analgesics over the years especially by adults.

Serious adverse effects may be experienced with the use of analgesics even with recommended doses over short periods of time.<sup>14</sup> It has been argued that because some analgesics contain psychotropic substances such as caffeine and codeine, addiction is apparent which leads to misuse.<sup>15</sup> Frequent use and overuse of analgesics may lead to several health complications: Aspirin is known to cause gastro-intestinal bleeding and ulcers, acetaminophen may cause liver malfunctioning and ibuprofen, renal failure.<sup>2</sup> Unfortunately, many users of analgesics are not aware of these adverse effects<sup>16</sup>. Analgesic use and its effects have been widely researched in developed countries; a few studies exist in some African countries, particularly Nigeria.<sup>17,18</sup>

In Ghana, studies have investigated the anti-inflammatory and anti-pyretic properties of various plant roots and barks.<sup>19-22</sup> However, very little research exists on the use of OTC analgesics in Ghana. The widespread use of and the adverse health implications associated with overuse of OTC analgesics necessitates the need to examine the factors that influence their use particularly among construction workers who by the nature of their profession are prone to pain and stress. This paper examines factors influencing the use of OTC analgesics among construction workers in the Ga-East Municipality of the Greater Accra region of Ghana.

## METHODS

### *Study area*

This study was carried out among construction workers in the Ga East Municipality (GEM) of the Greater Accra region of Ghana from April to June, 2013. The GEM is one of the 10 districts in the Greater Accra Region and covers a land area of 166 sq km; the capital is Abokobi. The estimated population for the GEM is 259,668; 127,258 (49%) males and 132,025 (51%) females.<sup>23</sup>

The GEM has four main sub-municipalities namely; Madina, Taifa, Dome-Kwabenya and Danfa made up of 34 multi-ethnic communities. About 82 percent of these communities are peri-urban. Initially, this study was intended to investigate OTC analgesic use among road workers constructing the Legon-Madina-Adenta road. Unfortunately, construction activities were halted at the time scheduled for data collection. Due to the time constraints of the study, it was decided that the study should be conducted in the adjoining municipality, where construction activities were extensive. The GEM is a fast-developing peri-urban area with various construction activities such as housing, drains and roads.

### *Sampling*

At the time of the study, construction activities such as masonry, carpentry, steel bending, digging and tilling were taking place in all the 15 major towns of the GEM. Seven (7) of these towns were randomly selected and 1 construction site per town was visited. The Yamane's formula for sample size calculation was used to derive a sample of approximately 206 workers. This calculation was based on a population of 407 construction workers from the 7 sites and a desired level of precision of 5% (Table 1).<sup>24</sup> At each site, the total number of construction workers was obtained from the respective managers. Then the number of people to be sampled was computed based on the proportionate contribution of each site to the total population of construction workers of the seven sites. This was done by dividing the number of construction workers of a given site by the sum of the seven sites and multiplied by the sample size for the study (Table 1). Each respondent was selected using systematic random sampling. The sampling interval was computed by dividing the number of people at each construction site by the number to be interviewed.

**Table 1** Distribution of Construction Workers and Sampling Procedure

Constructi on site	Num ber of work ers	Percen t contrib ution	Number sampled	Type of constr uction work	Type of construction work
Agbogba	61	15.0	31	Drains and Buildin gs	Masonry, carpentry, tilling and block laying.
Kwabenya	64	15.7	32	Road, Drains and Buildin g	Masonry, steel bending and carpentry.
Haatso	46	11.3	24	Buildin gs and Drains	Masonry and tilling.
Kisseiman	67	16.5	34	Roads and drains	Masonry, carpentry, tilling and steel bending.
Dome	63	15.5	32	Roads, drains and buildin gs	Masonry, carpentry and tilling.
Westlands	68	16.7	34	Roads, drains and buildin gs	Masonry, carpentry, and tilling.
Taifa	38	9.3	19	Road, drains and buildin gs	Masonry, carpentry and tilling.
Total	407	100	206		

**Data collection and analysis**

Data was collected from the GEM communities of Haatso, Agbogba, Taifa, Kwabenya, Westlands, Kisseiman and Dome where various construction activities such as masonry, carpentry, steel bending, digging and tilling were on-going. For this study, a construction worker is any male or female engaged in any of these construction activities.

A structured questionnaire was used to elicit responses on knowledge and types of analgesic used and factors influencing the use of analgesics. The questionnaire was in English but interviews were conducted in the preferred language of the respondent, English and the local languages Twi, Ga and Ewe.

Data was entered and analysed using IBM Statistical Package for the Social Sciences (SPSS) version 16.0. Background variables were described using proportions. The chi-square test of significance was computed to examine factors influencing analgesic use. A binary outcome variable (use of analgesics) was created. To

determine the influence of explanatory variables on use of analgesics, chi square analysis considered demographic variables, type and duration of construction work, source of information, stress levels and engaging in additional work.

**Ethics**

Ethical clearance was obtained from the Ethical Review Committee of the Ghana Health Service. Permission was also obtained from the Municipal Assembly Office and the respective managers of each site. Each construction worker was informed of the aim of the study and that participation was voluntary. Respective managers and respondents provided verbal consent.

**RESULTS**

**Background characteristics of construction workers**

Out of a total of 206 construction workers that were interviewed 11.3 percent worked at Haatso, 15.0 percent at Agbogba, 9.3 percent at Taifa, 15.7 percent at Kwabenya, 16.7 percent at Westlands and 16.5 percent at Kisseiman (Table 1). Most of the workers constructed buildings (63.6%), 30.1 percent worked on drains and only a few, 6.3 percent, worked on roads. Many of them (67 %) had done this construction work for over two years. The majority of workers were aged between 15 to 44 years (89.8%) and more than half were either married or cohabiting with partners (58.3%). The predominant ethnic group was the Ewe (36.4%) and 51.9 percent of respondents had completed Junior high school or its equivalent (Table 2).

**Knowledge and use of analgesics among construction workers**

In order to conceal the brand names of analgesics mentioned by respondents, each analgesic was renamed as “Brand” and assigned a unique number. Each “Brand” was identified by its active ingredients as provided by the “Brand” manufacturer’s website. Knowledge of the different types of analgesics was based on awareness of its use, required dosage, complications and side effects with extensive use. About 40 percent of respondents were familiar with at least two types of analgesics while 23.3 percent knew 3 types or more. Many respondents (68.0%) used Brand 1 (a locally manufactured analgesic – the active ingredients are paracetamol, aspirin and caffeine) compared to paracetamol (37.9%), Brand 2 is a locally manufactured analgesic; the main ingredients are aspirin, paracetamol and caffeine (31.6%), and Ibuprofen (9.7%). Only 24.1 percent of respondents paid attention to the expiry date of the drug and 31.6 percent had no knowledge of possible side effects of continuous use of the analgesics they took (Table 3).

Among those who used analgesics regularly, 34.7 percent often used more than one type of analgesic simultaneously (Table 4). Many respondents (68.3%) commonly took between 4-6 tablets or capsules of analgesics a day and 1.5 percent took between 1-2 tablets daily.

**Table 2** Background characteristics of respondents

Background characteristics	Frequency (N=206)	Percentage (%)
<b>Age</b>		
15 – 24	39	18.9
25 – 34	88	42.7
35 – 44	58	28.2
45 and above	21	10.2
<b>Marital Status</b>		
Never Married	77	37.4
Married/ Cohabiting	120	58.3
Divorced/Separated	9	4.4
<b>Ethnic Group</b>		
Akan	62	30.1
Ewe	75	36.4
Ga	27	13.1
Dagomba	12	5.8
Kusasi	20	9.7
Other	10	4.9
<b>Religion</b>		
Christian	172	83.5
Moslem	26	12.6
Traditional	8	3.9
<b>Highest educational level attained</b>		
None	12	5.8
Primary	15	7.3
Ordinary level/Junior High School	107	51.9
Advanced level/Senior High School	63	30.6
Tertiary	9	4.4
<b>Level of income</b>		
Less than GHC100 <sup>1</sup>	2	1.0
GHC100 – 299	22	10.7
GHC 300 – 499	90	43.7
GHC500 – 699	66	32.0
GHC700 – and above	26	12.6

<sup>1</sup> GHC = Ghanaian cedi. At the time of the study, 1 USD was equivalent to GHC 1.95. Therefore GHC 100 is equivalent to 195 USD.

About 86 percent of respondents purchased their painkillers from chemical shops and 7 percent of respondents took analgesics on prescription. The majority (80.4%) often took analgesics before work between 6am to 9am while 73.4 percent took their painkillers between 7pm to 10pm, after work; only 26.6 percent of respondents took painkillers after 10pm, before retiring to bed (Table 4).

**Table 3: Knowledge of analgesics among construction workers**

Knowledge of analgesics	Frequency (N=206)	Percentage (%)
<b>Brands of analgesics known</b>		
One	75	36.4
Two	83	40.3
Three or more	48	23.3
<b>Type of analgesics known</b>		
Paracetamol (acetaminophen)	78	37.9
Ipubrufen	20	9.7
Brand 1 <sup>1</sup>	140	68.0
Brand 2 <sup>2</sup>	65	31.6
Brand 3 <sup>3</sup>	25	12.1
Brand 4 <sup>4</sup>	51	24.75
Brand 5 <sup>5</sup>	13	6.31
<b>Reading drug information<sup>6</sup></b>		
Yes	48	24.1
No	151	75.9
<b>Known side effects with extensive use</b>		
Yes	141	68.4
No	65	31.6

1. Brand 1 is an analgesic that contains acetaminophine, aspirin and caffeine locally produced by a Ghanaian pharmaceutical company.

2. The main ingredients of Brand 2 are aspirin, paracetamol and caffeine and it is locally produced by a Ghanaian-based pharmaceutical company.

3. The main ingredient in Brand 3 is acetaminophine. It is produced by a British multinational pharmaceutical, biologics, vaccines and consumer healthcare company.

4. Brand 4 contains Paracetamol, caffeine and ephedrine hydrochloride. It is manufactured by a Ghanaian pharmaceutical company.

5. Brand 5 contains acetaminophine, aspirin and caffeine and is locally produced by a Ghanaian pharmaceutical company.

6. The drug information considered important and read by respondents was the expiry date.

All analgesics used in the study were registered with the Food and Drugs Authority.

Study findings revealed that 96.6 percent of construction workers used analgesics mostly to relieve pain and aches (66.4 %) and to induce sleep (26.6 %) (Table 4). The remaining (3.4%) used herbal medicines. Herbs commonly used were neem tree (*Azadirachta indica*) leaves and the leaves of the acacia plant (*Acacia sp*). Analgesics were commonly purchased over the counter from chemical sellers (85.9 %) and pharmacies (58.3 %). Attention was not paid to the expiry date (75.9 %).

The choice of the brand of analgesics was greatly influenced by advertisements on radio and television (72.9%) and by friends and relatives (64.3%) (Table 4).

**Table 4** Use of analgesics among construction workers

Use of analgesics <sup>1</sup>	Frequency (N=199)	Percentage (%)
<b>Number of tablets/capsules taken per day</b>		
1 – 2	3	1.5
2 – 4	69	34.7
4 – 6	123	61.8
More than 6	4	2.0
<b>Usual time for taking analgesics<sup>2</sup></b>		
Before work (6-9am)	160	80.4
After work (7 – 10pm)	146	73.4
Before bedtime (after 10pm)	53	26.6
<b>Use of more than one analgesic simultaneously</b>		
Yes	69	34.7
No	130	65.3
<b>Reasons for analgesic use</b>		
When prescribed	14	7.0
To induce sleep	53	26.6
To Relieve Aches and Pains	132	66.4
<b>Factors informing choice</b>		
Advertisements	145	72.9
Friends	128	64.3
Prescriptions	14	7.0
Other	4	2.0
<b>Source of analgesics</b>		
Pharmacy Shops	116	58.3
Chemical Shop	171	85.9
Drug Peddlers	8	4.0
From Friends	24	12.1

<sup>1</sup>Only 199 of the 206 respondents used analgesics during the study period.

<sup>2</sup>Respondents provided more than one response. This is probable because of combining different analgesics and taking more than one tablet/capsule simultaneously.

**Factors influencing use of analgesics**

Chi square analysis showed that the type of construction work engaged in and the number of years spent at work did not influence the use of analgesics ( $p>0.05$ ) (Table 5). Some construction workers (57%) were engaged in other manual jobs aside construction work; however, there was no significant association between engagement in other manual jobs and the use of analgesics ( $p>0.05$ ), (Table 5). Knowledge of the types of analgesics, dosage and side effects did not influence use ( $p>0.05$ ).

Television and radio advertisements influenced use of analgesics among majority of construction workers (72.9%,  $p<0.01$ ) (Table 5). Other sources of information were friends, chemical sellers/ pharmacies and relatives. However, these other sources did not have any association with the use of analgesics ( $p>0.05$ ) (Table 5).

**Table 5: Factors influencing use of analgesics**

Factors	Use N = 199 Freq. <sup>1</sup> (Percent)	Non use (N=7) Freq. (Percent)	$\chi^2$ (df) <sup>2</sup>	P-value <sup>3</sup>
<b>Type of construction</b>				
Road	13 (100)	0 (0)	0.90(2)	0.639
Drains	59 (95.2)	3 (4.8)		
Building	127 (96.9)	4 (3.1)		
<b>Duration of work</b>				
0–6 months	19 (100)	0 (0)	1.83(3)	0.609
7–12 months	26 (96.3)	1 (3.7)		
13–24 months	22 (100)	0 (0)		
> 24 months	132 (95.65)	6 (4.35)		
<b>Sources of information</b>				
<i>Advertisements</i>				
Yes	145 (100)	0 (0)	17.2(1)	0.000
No	54 (88.5)	7 (11.5)		
<i>Friends</i>				
Yes	128 (95.5)	6 (4.5)	1.36(1)	0.243
No	71 (98.6)	1 (1.4)		
<i>Prescribers</i>				
Yes	14 (100)	0 (0)	0.53(1)	0.467
No	185 (96.4)	7 (3.6)		
<i>Other</i>				
Yes	4 (80.0)	1 (20)	4.28(1)	0.039
No	194 (97.0)	6 (3.0)		
<b>Highest educational level</b>				
No education	10 (83.3)	2 (16.7)	10.01(4)	0.040
Primary	15 (100)	0 (0)		
Ordinary level/Junior High School	15 (95.3)	5 (4.7)		
Advanced level/Senior High School	63 (100)	0 (0)		
Tertiary	9 (100)	0 (0)		
<b>Religion</b>				
Christian	168 (97.7)	4 (2.3)	4.08(2)	0.130
Muslim	24 (92.3)	2 (7.7)		
Traditional	7 (87.5)	1 (12.5)		
<b>Stress Level<sup>4</sup></b>				
Quite Stressful	29 (96.7)	1 (3.3)	0.00(1)	0.983
Very Stressful	170 (96.6)	6 (3.4)		
<b>Additional Work<sup>5</sup></b>				
Yes	115 (97.5)	3 (2.5)	0.62(1)	0.432
No	84 (95.5)	4 (4.5)		

<sup>1</sup>Perc. = percent; <sup>2</sup>= Chi-square (Degree of freedom); <sup>3</sup>= p-value is 0.05; <sup>4</sup>= Stress levels were measured on a 7 point scale; <sup>5</sup>= extra work aside from construction.

Respondents' stress levels were assessed using 7 indicators of work-related stress. These indicators were: experiencing muscle, joint pains and headaches after each day's work; at least being absent from work for a day as a result of work-related fatigue or sickness; engaging in strenuous work that required alertness; resting less than 1 hour while on the job; eating poorly after work as a result of fatigue; increased analgesic use

in order to cope with the exigencies of the job; feeling depressed.

Persons who experienced between 5 to 7 of all the indicators were classified as “very stressed”, those who experienced between 3-5 of these indicators were classified as “moderately stressed” “mildly stressed” persons experienced between 1-3 indicators; respondents were however moderately or very stressed. Stress levels showed no significant association with analgesic use ( $p > 0.05$ ) (Table 5).

### DISCUSSION

This study examined the use of analgesics among construction workers in the Ga East Municipality of the Greater Accra region, Ghana. Knowledge of analgesics with respect to required dosage, knowledge of the potential risk of prolonged use of analgesics, the importance of reading drug information before use, the dangers with simultaneous use of more than one type of analgesic was low for more than half of respondents. These findings are consistent with research from developed countries and a few from Africa.<sup>2, 18, 25</sup>

In our study, being a construction worker and the number of years spent on the job had no influence on the use of analgesics. Additionally, very respondents knew about the recommended dosage and side effects of painkillers they took and they consumed more than the stipulated dose. This practice is very common among analgesic users.<sup>9, 18</sup> Analgesics offer many benefits: They are commonly used to relieve headaches and symptoms of flu, musculoskeletal aches and pains and to reduce inflammation in the limbs.<sup>16, 26</sup> Albeit, many users of analgesics are unaware of the required dosage, health hazards of continuous use or misuse and fail to read the labels and medical literature on these medications.<sup>27</sup>

Stress levels are known to influence the use of analgesics.<sup>28, 29</sup> This was not the case in this study; stress levels had no association with the use of analgesics although majority of respondents indicated that they were stressed. Probably in anticipation of pain and to offset any form of body pain, majority of respondents took analgesics before the commencement of the day's work. This practice resulted in the overuse of analgesics as many respondents indicated taking more than the required daily dose and taking it frequently. Study respondents also combined different analgesics for fast relief from body aches and the stress of the day's work. Although analgesics are considered to be safe when the required dosage is adhered to, there are potential risks to the user if used inappropriately.

These are irreversible health implications that include gastrointestinal problems, liver toxicity and kidney failure.<sup>2, 30, 31</sup> However many users of analgesics are ignorant of this<sup>32</sup> Additionally, frequent use of analgesics is also associated with psychological problems such as depression and may lead to psychiatric disorders.<sup>33</sup>

Although analgesics are consumed for the relief of headaches and pains, studies show that inappropriate and continuous use of analgesics may lead to medication-overuse headache (MOH) which is characterised by daily chronic headaches anxiety, and depression.<sup>34</sup> MOH is considered a public health problem with a worldwide prevalence of 1–2% and there is no standard treatment procedure.<sup>34</sup> However, in Ghana, there is no known population-based survey to determine the epidemiology of MOH although there is evidence to suggest the abuse of analgesics<sup>35</sup>. Some studies have argued that the increasing costs of health care and the availability of NSAIDs as OTCs have influenced their use as a quick remedy for minor ailments such as headaches, influenza and musculoskeletal pains.<sup>36, 37</sup> This study did not investigate the influence of high health care and analgesic use; there is limited evidence on the issue in Ghana.

Study findings indicate that respondents' knowledge and choice of analgesics was influenced greatly by advertisements from the media. In Ghana, the media, especially radio and television, play a huge role in marketing a wide range of medical products including analgesics and other OTCs. The media has an important role to play in creating awareness, education and an effective tool for social marketing. For many, the media is a credible source of information. If information from the media is not synthesised properly it may produce undesired results. In Poland, television advertising of analgesics influenced consumption among medical students.<sup>38</sup> However, this is contradictory to a study conducted in Bulgaria where respondents' knowledge of analgesics was influenced greatly by medical doctors; the influence of the media was minimal.<sup>39</sup>

In light of our study findings, we recommend that pharmacists and chemists should educate clients on the health dangers of overindulgence in analgesics. There are many chemist shops in the country; some are licensed. However, it is not clear if the operators of these shops and their attendants are aware of the health risks of analgesic misuse. The Pharmacy Council and relevant bodies should organise regular public health programmes aimed at educating chemists and the general public about the risks of analgesic misuse.

The Food and Drugs Authority should regulate the proliferation of advertisements for analgesics in the media. The media on the other hand should be used to create more awareness on the harmful health effects of misuse of analgesics.

### STUDY LIMITATIONS

Initially, this study was intended to investigate the use of analgesics among road labourers constructing the Legon-Madina-Adenta road. Unfortunately, construction activities were halted at the time scheduled for data collection. Due to the time constraints of the study, it was decided that the study should be conducted in the adjoining municipality, where construction activities were extensive. Nevertheless, study findings indicate factors influencing use of OTC analgesics among construction workers and could serve as a basis for future large scale-studies.

### CONCLUSION

This study reports findings from a research of a group of people – construction workers - who are likely to take analgesics for pain relief as a result of their occupation. Knowledge of analgesics and probable serious side effects was not adequate. Furthermore, respondents were overdosing on analgesics and taking multiple analgesics simultaneously. There is the need for collaboration between the Food and Drugs Authority, the Pharmacy Council and the media to sensitise the public on the adverse effects of the extensive use and misuse of analgesics.

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