

Colonoscopy a True Therapeutic Icon

Ahmed. Z. Kaleem, Nabish Naheed, Syed M. Ahmad

Colorectal Department, Northern Lincolnshire and Goole NHS Foundation Trust, Scunthorpe, UK

Email: ahmed.kaleem@nhs.net

How to cite this paper: Kaleem, A.Z., Naheed, N. and Ahmad, S.M. (2017) Colonoscopy a True Therapeutic Icon. *Surgical Science*, 8, 287-298.

<https://doi.org/10.4236/ss.2017.87031>

Received: February 13, 2017

Accepted: July 7, 2017

Published: July 10, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative

Commons Attribution International

License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Colonic polypectomy remained the first colonoscopic therapeutic intervention which was successfully accomplished with the help of an early snare. This therapeutic procedure was executed by Dehyle in Europe and Shinya in USA in 1971 [1]. Thus, these two colonoscopists acquired the pioneer's position of therapeutic colonoscopy. Now the colonoscopy has achieved a special status in treating colorectal diseases because of its unique therapeutic aspect. The common uses of therapeutic colonoscopy are broadly classified in to the four major categories because of its unique therapeutic properties. These uses include resection and ablation, hemostasis, decompression with or without recanalization and foreign body extraction. Colonic perforation remained an absolute contraindication to therapeutic colonoscopy which is analogous to diagnostic colonoscopy. Good Communication plays a vital role in accomplishment of successful therapy with the help of colonoscopy. Consent process remained a complex process which should be well organized and tailored as per patient's needs. There are lot of advancements in colonoscopy in recent years and many new procedures and treatment modalities have become available to treat colorectal diseases with the help of colonoscope. The recent advancement in colonoscopy has led to having many novel techniques. This therapeutic colonoscopy has made a significant change in current colorectal cancer management as polyps can be treated in the early stage, thus reducing the incidence of colorectal cancer. This is the basis of the United Kingdom existing bowel screening program, which is only feasible because of colonoscopy-induced interventions. The successful uses of these techniques obviate the need for a major surgical operation and colorectal disease can be treated with minimally invasive colonoscopic methods. These attributes make colonoscopy a true therapeutic icon.

Keywords

Therapeutic Colonoscopy, Indication, Contraindication, Complications, Colorectal Cancer, Diverticular Disease, Consent, Communication

1. Therapeutic Indications

The common uses of therapeutic colonoscopy can be broadly classified into the following four major categories [2], as is shown in the **Figure 1**.

1.1. Resection and Ablation

Polypectomy is the most common therapeutic maneuver performed during colonoscopy [3]. This therapy alone has reduced the incidence of bowel cancer by simply breaking the adenoma to carcinoma sequence with the help early detection and removal of polyps. This is now the basis of bowel cancer screening program. Polypectomy is an essential skill for all the colonoscopists. The finding of a polyp which is greater than 1 cm during flexible sigmoidoscopy should be offered another procedure in the form of colonoscopy as 30% - 50% of these patients having additional polyps [4].

There are certain techniques currently in use, both basic as well as advanced, for removal of colonic and rectal polyps:

- 1) Cold biopsy;
- 2) Hot biopsy;
- 3) Cold snare polypectomy;
- 4) Hot snare polypectomy;
- 5) Endoscopic mucosal resection;
- 6) Endoscopic mucosal dissection;
- 7) Colonoscopic assisted laparoscopic polypectomy.

1.1.1. Cold Biopsy

Smaller polyps which are less than 4 mm in size could be excised with this technique [5]. It is vital to examine biopsy site for any residual polyp and for any obvious bleeding by colonoscopists. It is also necessary to retrieve the excised polyp as future management depending on its histology.

1.1.2. Hot Biopsy

Safe use of diathermy is advocated in his technique. This technique is used to reduce post-polypectomy bleeding. Smaller polyp can be excised with this

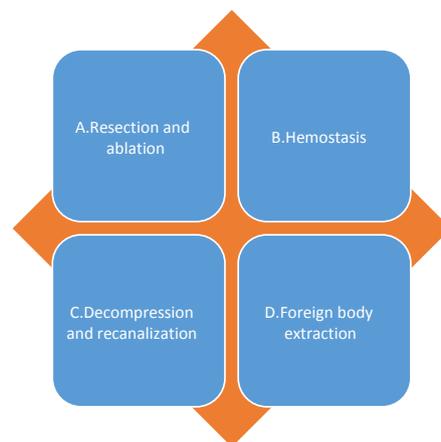


Figure 1. Uses of therapeutic colonoscopy.

technique, but it is recommended to avoid this technique proximal to splenic flexure of colon as there is more risk of post-procedural complication. Colon is relatively thin on that location and diathermy can lead to delayed bleeding and perforation [5].

It is also noted that there is high incidence of residual tissue with this technique [3]. This fact makes it less preferred among colonoscopists and only use is recommended in small left side polyps.

1.1.3. Cold Snare Polypectomy

This technique is mostly used to remove polyps which are larger than 1 cm [3]. There is slightly more risk of post-polypectomy bleeding with cold snare polypectomy as compared to hot snare polypectomy.

1.1.4. Hot Snare Polypectomy

Diathermy is used in this technique and monopolar current is carefully applied on the polyp base to have a good hemostatic effect. Snare used polypectomy is still most frequently utilized polypectomy method in practice.

1.1.5. Endoscopic Mucosal Resection

Endoscopic mucosal resection (EMR) is a technique in which fluid is infiltrated in to submucosal place to lift the mucosa and polyp to achieve safe polypectomy [5]. This technique can be used to remove most adenomas and intra mucosal cancers [6]. Flat polyps are best dealt with this method. Non-lifting is a worrying sign as this could be an indication of malignancy and only biopsy with tattooing should be done in that situation. Further management depends upon the histology of the polyp. Polyps which are larger than 2 cm are usually not treated with this method as EMR is less likely to achieve complete resection [7] [8].

1.1.6. Endoscopic Mucosal Dissection

Endoscopic submucosal dissection (ESD) is also performed to achieve polypectomy in large polyps which are bigger than 2 cm. It is a complex procedure with a higher risk of perforation than EMR [7] [8].

1.1.7. Colonoscopic Assisted Laparoscopic Polypectomy

This is a novel technique which is recommended for excision of right sided large, flat and wide based polyps [9]. These polyps are not suitable for colonoscopic excision alone thus, require a combined approach. This technique involves simultaneous use of colonoscope and laparoscope. This procedure obviates the need of a major colorectal resection therefore, significantly improve patient's outcome.

1.2. Hemostasis

Colonoscopy has a definite role in hemostasis. This is also noted that poor views in acute settings can be a problem in delivering this therapy but it is worth attempting this treatment modality as it can make a significant change in patient management. Colonoscopy can be used for hemostasis in the following conditions [4]:

- 1) Diverticular bleed;
- 2) Arteriovenous malformation;
- 3) Radiation induced mucosal injury;
- 4) Angiodysplasia.

There are different treatment adjuncts, currently in use, delivered with the help of colonoscope to obtain this hemostasis. These adjuncts include epinephrine injection, thermal coagulation and metallic clip placement [6].

1.2.1. Diverticular Bleed

Diverticular disease can lead to diverticular bleeding which mostly stops with the conservative measures only. Occasionally it is persistent and need colonoscopic intervention. This can be dealt with the application of metallic clip on that bleeding vessel [10] [11].

1.2.2. Arteriovenous Malformation

Bleeding from colonic arteriovenous malformation can also be treated with colonoscopic interventions

1.2.3. Radiation Induced Mucosal Injury

This includes radiation induced proctitis and argon beam therapy with the help of colonoscopy is successfully used to acquire hemostasis which can result in significant symptomatic relief.

1.2.4. Angiodysplasia

Vascular ectasias, like angiodysplasia, can be treated with either thermal or epinephrine injection through colonoscope. It is now established that thermal cauterization has acquired 87% of success rate [12].

1.3. Decompression and Recanalization

Decompression and recanalization of obstructed or dilated bowel can be achieved with the help of colonoscopy. Its role is well recognized in the following conditions:

- 1) Volvulus;
- 2) Acute colonic pseudo-obstruction (Ogilvie's syndrome);
- 3) Obstructed tumour;
- 4) Strictures.

1.3.1. Volvulus

This is condition in which bowel twists around its mesentery. It is common in sigmoid colon and can also present in caecum though slightly less common as compared to sigmoid. Colonoscopy is in use for some time to untwist and resolve this volvulus. Unstable patients need immediate surgery as this acute bowel twist can lead to bowel ischemia and perforation. However, patients with less severe sigmoid and caecal volvulus can be treated with the help of colonoscopic intervention [13]. It is also established that sigmoid volvulus can be treated and corrected with better success rate as compared to caecal volvulus with this colonoscopic intervention [14].

1.3.2. Acute Colonic Pseudo-Obstruction

This is a condition in which there is no true mechanical cause of obstruction. This is also termed as Ogilvie's syndrome. The treatment initially is a conservative management which requires only correction of underlying cause. These causes could be multifactorial. Endoscopic decompression of an acute colonic pseudo-obstruction is well established and if the initial management fails, colonoscopic decompression is recommended [15].

1.3.3. Obstructed Tumour

There is a definite role of colonoscopic inserted stent placement in cases of obstruction. This stent is called self-expanding metal stent (SEMS) and requires radiological guidance. This stent placement could be either to achieve bridge to surgery effect or palliation effect only. Studies have compared SEMS placement with surgery, and found high clinical success rates (92%) improved symptomatic relief and fewer complication rates (<5%) with colonoscopic SEMS placement [16].

Argon plasma coagulation (APC) and snare polypectomy can also be used to treat and maintain luminal patency. These should be regarded as good substitutes to self-expanding metal stent, in managing colonic obstruction [17].

1.3.4. Strictures

Strictures can also lead to obstructed symptoms. These strictures could be related to either previous anastomosis or inflammatory bowel disease. These strictures can also be treated and dilated with the help of colonoscope. Success rate is found to be high with a low complications rate though, recurrence is common [6].

This therapy can be achieved with balloon dilation which can be occasionally combined with steroid injection and electro-incision [18].

1.4. Foreign Body Extraction

There is a little role of colonoscopy in extracting foreign body from rectum or colon. It is worth mentioning that if there is any suspected foreign body induced perforation or the radiological exam indicates higher lying object then colonoscopy should not be attempted. It is noted that colonoscopy on these above-mentioned occasions can lead to an unnecessary delay in surgical management with potential harmful consequences [19].

2. Contraindication

Contraindications for therapeutic colonoscopy are analogous to diagnostic colonoscopy. The list includes the following:

- 1) Colonic perforation;
- 2) Refusal of a patient;
- 3) Severe coagulopathy;
- 4) Immediately post-operative patients;
- 5) Recent myocardial infarction;
- 6) Pulmonary embolism;

- 7) Hemodynamic instability;
- 8) Acute diverticulitis;
- 9) Ascites / Peritoneal dialysis.

3. Complications

Complications in therapeutic colonoscopy are replica to diagnostic colonoscopy complications, although the incidence of these complications is higher in therapeutic procedure due to obvious reasons. It is also noted that complications are frequently worsened by delay in diagnosis and management [3].

The following are the most common untoward events which could arise due to therapeutic colonoscopy:

- 1) Bleeding;
- 2) Perforation;
- 3) Infection;
- 4) Missed diagnosis;
- 5) Lost specimens.

3.1. Bleeding

Bleeding is the most common complication which could happen after therapeutic colonoscopy. It is mostly the result of ineffective hemostasis after polypectomy. Larger polyps which are 1.5 cm in size are more vulnerable to bleed [3]. This bleeding could be either immediate or delayed bleeding. Delayed bleeding can manifest itself even uphill 30 days.

3.2. Perforation

The perforation rate doubles in therapeutic procedures as compared to diagnostic procedure only [3]. Thus, it is mandatory for all to patients, who are undergoing colonoscopy, to be fully informed about this deadly complication, its consequences and management plan.

3.3. Infection

Fortunately, this complication is not very common. Infectious organism can transfer from one patient to another through colonoscope. High risk patient should have pre-procedure antibiotics to minimize the risk of bacteremia.

3.4. Missed Diagnosis

It is classified as a serious complication. There are many reasons of occurrence of this missed diagnosis. Poor bowel preparation could be a leading cause of this failure and must be reported so that appropriate actions can be taken.

This missed diagnosis is more common in three colonic areas which are termed as silent regions. These regions include distal rectum, caecum and splenic flexure of transverse colon. These areas should be carefully assessed by colonoscopists. Colonoscopic examination is not considered as complete examination without caecal visualization. Unfortunately, this caecal visualization is not

possible in 5% - 10% of cases [3] and therefore can also contribute in to this missed diagnosis category.

3.5. Lost Specimens

Specimen retrieval is important in therapeutic colonoscopic procedures as histological diagnosis of excised polyp is established and future management planning depends upon this histological diagnosis. It is not uncommon to lose small polyps thus it is paramount to consent patient for this complication.

4. Communication

The author has provided detailed principles related to colonoscopic related communication in his attached diagnostic colonoscopic assignment. The same principles apply to therapeutic colonoscopy. It is paramount to provide all the information related to colonoscopy and associated therapy to patients in easy to understand format. Communicational break down or gap is found to be a disaster and foundation of most of the complaint process.

It is important to follow this below mentioned principle in all consultations:

“The patient will never care how much you know, until they know how much you care.” (Terry Canale in his American Academy of Orthopedic Surgeons Vice Presidential Address) [20].

The author recommends to following the below mentioned summarized guidance when carrying out communication related to therapeutic colonoscopy:

- Encourage patient centered communication;
- Avoid linear communication;
- Discourage passive approach;
- Doctor or colonoscopist role;
- Encourage reciprocal relation;
- Respect patient preferences.

4.1. Encourage Patient Centered Communication

It is vital to understand and reflect that colonoscopic related communication should always evolve around patient. Different patients have got different needs and health care individual needs to understand this fact and replicate this in their communication.

4.2. Avoid Linear Communication

It is important to avoid unidirectional communication which was traditional method in use. This traditional method could not produce an effective and successful communication model so should not be followed in therapeutic colonoscopy.

4.3. Discourage Passive Approach

It is advisable to discourage passive approach shown by any patient. Patient should be encouraged to be involved in decision making process with mutual and active involvement.

4.4. Doctor or Colonoscopist Role

Doctors or colonoscopists should act like a facilitator. They should not adopt a dominant role and help patients with their effective communication in decision making exercise. It is also worth mentioning that colonoscopists and doctors should avoid sitting on a fence rather they should guide their patients appropriately.

4.5. Encourage Reciprocal Relation

It is a duty of colonoscopists to encourage reciprocal relationship in communication. They should facilitate shared decision making progress with collective role.

4.6. Respect Patient Preferences

Patient preferences should be sought and respected always without any fail. It is noted that doctors are worried about patient illness and patients are worried about their wellness.

The author has found that the below mentioned six function model of De Haes and Bensing is extremely useful in achieving effective communication.

This is a model in which communication follow through many step and result in a very successful consultation. There are six main stages of this model (**Figure 2**). The author strongly suggests following all these steps in disseminating information about colonoscopy to patients and consent acquisition phase.

The first stage is rapport building, which then lead to information collecting stage. Information gathering stage is a clear manifestation that communication is always a two-way process and unilateral communication should be discouraged. Information delivery is the next stage where colonoscopists is expected to provide all the necessary information about clinical issue and proposed treatment plan. This result in decision making stage and lead to develop enough knowledge for a patient to understand disease and treatment related aspects. In the final stage the colonoscopist addresses any patient's concerns and responds to patient's emotional needs.

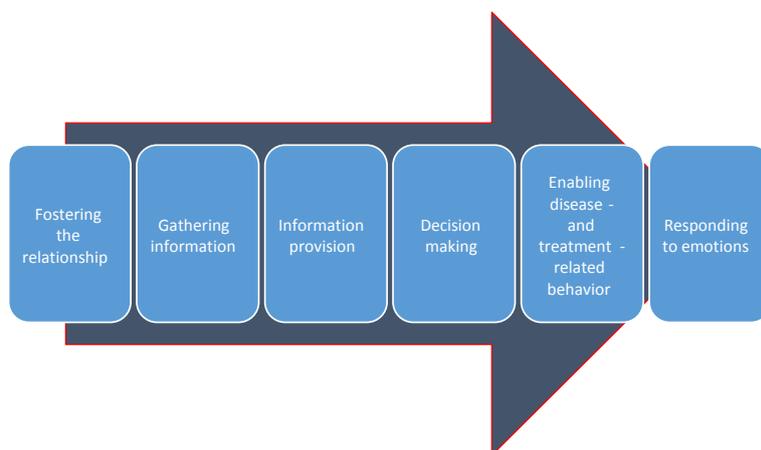


Figure 2. The 6-function model of de haes and bensing, 2009 [21].

5. Consent

Consent process is discussed in depth in the attached diagnostic colonoscopy assignment. The same ideology and principles apply for therapeutic colonoscopy procedures. Consent is acquisition of permission to provide any intervention to a subject which could be examination, investigation or treatment. It is a complex process which should be well organized and tailored as per patient's needs. As a rule, a complete informed consent process should comprise of the seven components (Figure 3).

5.1. Confirming Patient's Role

This is that initial step of consent obtaining process in which health care individual, proposing the colonoscopic therapy, first time interacts with his patient. It is a time to clear patient's role in this decision making process. Patient should be assured that this consultation will be a mutual process with him being actively involved.

5.2. Clinical Problem and Proposed Treatment Description

In this stage, patient is fully informed about clinical issue and proposed treatment. Patient should be provided information about rational behind suggested treatment.

He needs to know about incidence of his disease and success rate of proposed treatment.

5.3. Alternatives to Proposed Treatment Provision

Always provide any available alternative to your patient. Patient should be provided with the knowledge about consequences of not opting for any proposed treatment at this stage.

5.4. Risks and Benefits Conversation

All the risk and benefits of offered treatment and alternatives should be discussed in details at this point. Patient has also right to know about result of no



Figure 3. The 7 elements of consent [22].

treatment option. These risk and benefits should also clearly be documented in written consent form.

5.5. Related Reservations Discussion

This is the stage where patient should be encouraged to express any concerns. All questions should be answered and uncertainties should be cleared to the best of colonoscopist's ability.

5.6. Patient's Understanding Assessment

This is a vital stage where it is evident whether colonoscopist is successful in disseminating important information or not. This is patient's understanding assessment but this is an indirect assessment of a colonoscopist.

5.7. Establishing the Patient's Preference

It is the stage, where based on all previous stages a patient is ready to express his wishes and preferences. At this stage a formal consent is taken only after patient's complete satisfaction.

The author recommends the fellow colonoscopists to follow all these seven vital steps to obtain consent, only then consent process is classed as complete and fully informed procedure.

6. Summary

In summary, the recent advancement in colonoscopy has led to having many novel techniques. This therapeutic colonoscopy has made a significant change in current colorectal cancer management as polyps can be treated in the early stage, thus reducing the incidence of colorectal cancer. This is the basis of the United Kingdom existing bowel screening program, which is only feasible because of colonoscopic-induced interventions. The successful uses of these techniques obviate the need for a major surgical operation and colorectal disease can be treated with minimally invasive colonoscopic methods.

References

- [1] Haycock, A., Cohen, J., Saunders, B.P., Cotton, P.B. and Williams, C.B. (2013) Cotton and Williams' Practical Gastrointestinal Endoscopy. John Wiley & Sons, Hoboken.
- [2] Ka, F. (1992) Therapeutic Colonoscopy.
- [3] Smith, C.D., Fink, A.S., Van Stiegmann, G. and Easter, D.W. (2006) The SAGES Manual. Springer, New York City, 611-625.
- [4] David E Stein, J.L.B. (2016) Colonoscopy.
- [5] Phillips, R.K. and Clark, S. (2013) Colorectal Surgery: Companion to Specialist Surgical Practice. Elsevier Health Sciences, Amsterdam.
- [6] Bhagatwala, J., Singhal, A., Aldrugh, S., Sherid, M., Sifuentes, H. and Sridhar, S. (2015) Colonoscopy—Indications and Contraindications.
- [7] Tajika, M., Niwa, Y., Bhatia, V., Kondo, S., Tanaka, T., Mizuno, N., Hara, K., Hijioka, S., Imaoka, H. and Ogura, T. (2011) Comparison of Endoscopic Submucosal

- Dissection and Endoscopic Mucosal Resection for large Colorectal Tumors. *European Journal of Gastroenterology & Hepatology*, **23**, 1042-1049. <https://doi.org/10.1097/meg.0b013e32834aa47b>
- [8] Saito, Y., Fukuzawa, M., Matsuda, T., Fukunaga, S., Sakamoto, T., Uraoka, T., Nakajima, T., Ikehara, H., Fu, K.-I. and Itoi, T. (2010) Clinical Outcome of Endoscopic Submucosal Dissection versus Endoscopic Mucosal Resection of Large Colorectal Tumors as Determined by Curative Resection. *Surgical Endoscopy*, **24**, 343-352. <https://doi.org/10.1007/s00464-009-0562-8>
- [9] Kaleem, A., Strachan, C., Whittaker, L. and Ahmad, S. (2013) Colonoscopically Assisted Laparoscopic Polypectomy—An Alternative to Right Hemicolectomy for Large Right-Sided Benign Polyps. *Surgical Science*, **4**, 350. <https://doi.org/10.4236/ss.2013.48069>
- [10] Savides, T.J. and Jensen, D.M. (1994) Colonoscopic Hemostasis for Recurrent Diverticular Hemorrhage Associated with a Visible Vessel: A Report of Three Cases. *Gastrointestinal Endoscopy*, **40**, 70-73. [https://doi.org/10.1016/S0016-5107\(94\)70014-1](https://doi.org/10.1016/S0016-5107(94)70014-1)
- [11] Binmoeller, K., Thonke, F. and Soehendra, N. (1993) Endoscopic Hemoclip Treatment for Gastrointestinal Bleeding. *Endoscopy*, **25**, 167-170. <https://doi.org/10.1055/s-2007-1010277>
- [12] Santos, J., Aprilli, F., Guimaraes, A. and Rocha, J. (1988) Angiodysplasia of the Colon: Endoscopic Diagnosis and Treatment. *British Journal of Surgery*, **75**, 256-258. <https://doi.org/10.1002/bjs.1800750323>
- [13] Swenson, B.R., Kwaan, M.R., Burkart, N.E., Wang, Y., Madoff, R.D., Rothenberger, D.A. and Melton, G.B. (2012) Colonic Volvulus: Presentation and Management in Metropolitan Minnesota, United States. *Diseases of the Colon & Rectum*, **55**, 444-449. <https://doi.org/10.1097/DCR.0b013e3182404b3d>
- [14] Halabi, W.J., Jafari, M.D., Kang, C.Y., Nguyen, V.Q., Carmichael, J.C., Mills, S., Pigazzi, A. and Stamos, M.J. (2014) Colonic Volvulus in the United States: Trends, Outcomes, and Predictors of Mortality. *Annals of Surgery*, **259**, 293-301. <https://doi.org/10.1097/SLA.0b013e31828c88ac>
- [15] Tsirline, V.B., Zemlyak, A.Y., Avery, M.J., Colavita, P.D., Christmas, A.B., Heniford, B.T. and Sing, R.F. (2012) Colonoscopy Is Superior to Neostigmine in the Treatment of Ogilvie's Syndrome. *The American Journal of Surgery*, **204**, 849-855. <https://doi.org/10.1016/j.amjsurg.2012.05.006>
- [16] Frago, R., Ramirez, E., Millan, M., Kreisler, E., Del, V.E. and Biondo, S. (2014) Current Management of Acute Malignant Large Bowel Obstruction: A Systematic Review. *The American Journal of Surgery*, **207**, 127-138. <https://doi.org/10.1016/j.amjsurg.2013.07.027>
- [17] Baumhoer, D., Armbrust, T. and Ramadori, G. (2005) Nonsurgical Treatment of the Primary Tumor in Four Consecutive Cases of Metastasized Colorectal Carcinoma. *Endoscopy*, **37**, 1232-1236. <https://doi.org/10.1055/s-2005-870225>
- [18] Hassan, C., Zullo, A., Francesco, V., Ierardi, E., Giustini, M., Pitidis, A., Taggi, F., Winn, S. and Morini, S. (2007) Systematic Review: Endoscopic Dilatation in Crohn's Disease. *Alimentary Pharmacology & Therapeutics*, **26**, 1457-1464. <https://doi.org/10.1111/j.1365-2036.2007.03532.x>
- [19] Koornstra, J.J. and Weersma, R.K. (2008) Management of Rectal Foreign Bodies: Description of a New Technique and Clinical Practice Guidelines. *World Journal of Gastroenterology*, **14**, 4403-4406. <https://doi.org/10.3748/wjg.14.4403>
- [20] Tongue, J.R., Epps, H.R. and Forese, L.L. (2005) Communication Skills for Patient-Centered Care. *Journal of Bone and Joint Surgery*, **87**, 652-658.

<https://doi.org/10.2106/00004623-200503000-00027>

- [21] Haes, H. and Bensing, J. (2009) Endpoints in Medical Communication Research, Proposing a Framework of Functions and Outcomes. *Patient Education and Counseling*, **74**, 287-294. <https://doi.org/10.1016/j.pec.2008.12.006>
- [22] Shekelle, P.G., Wachter, R.M., Pronovost, P.J., Schoelles, K., McDonald, K., Dy, S., Shojania, K., Reston, J., Berger, Z. and Johnsen, B. (2013) Making Health Care Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices. *Evidence Report/Technology Assessment*, 1.



Scientific Research Publishing

Submit or recommend next manuscript to SCIRP and we will provide best service for you:

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.

A wide selection of journals (inclusive of 9 subjects, more than 200 journals)

Providing 24-hour high-quality service

User-friendly online submission system

Fair and swift peer-review system

Efficient typesetting and proofreading procedure

Display of the result of downloads and visits, as well as the number of cited articles

Maximum dissemination of your research work

Submit your manuscript at: <http://papersubmission.scirp.org/>

Or contact ss@scirp.org

